**3GPP TSG-SA5 Meeting #143-e *S5-223298***

e-meeting, 9 - 17 May 2022 (revision of xx-yyxxxx)

**Source: ZTE, China Telecom**

**Title: New SID on Closed control loop governance for autonomous network**

**Document for: Approval**

**Agenda Item: 6.2**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on Closed control loop governance for autonomous network

Acronym: FS\_CCLAN

Unique identifier:

{A number to be provided by MCC at the plenary}

Potential target Release: Rel-18

# 1 Impacts

{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  |  | X | X |  |
| No | X | X |  |  |  |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a

|  |  |
| --- | --- |
|  | Feature |
|  | Building Block |
|  | *Work Task* |
| X | Study Item |

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

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| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

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| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 870030 | Rel-17 Work Item on Enhanced Closed loop SLS Assurance | This study will investigate the feasibility to reuse or extend the closed control loop mechanism proposed by this work item.  |
| 810027 | Rel-17 Work Item on Intent driven management services for mobile networks | This study will investigate whether the use cases in this work item can be part of a closed control loop. |
| 850028 | Rel-17 Work Item on Enhancement of Management Data Analytics Service | This study will investigate whether the use cases in this work item can be a closed control loop or part of a closed control loop. |
| 870028 | Rel-17 Work Item on Self-Organizing Networks (SON) for 5G networks | This study will investigate whether the use cases in this work item can be a closed control loop or part of a closed control loop. |
| 880027 | Rel-17 Work Item on Autonomous network levels | This study will investigate whether the use cases in this work item can be a closed control loop. |
| 870022 | Rel-17 Work Item on Enhancements on EE for 5G networks | This study will investigate whether the use cases in this work item can be a closed control loop or part of a closed control loop. |

# 3 Justification

Currently, SA5 has an ongoing closed control loop related work item - Enhanced Closed loop SLS Assurance (870030 - eCOSLA), which mainly focuses on the closed control loop for SLS assurance. The mechanism defined in eCOSLA may be general for closed control loops governance, but the existing use cases in TS 28.535 are all SLS assurance related, and the existing solution of the closed control loop mechanism mainly focuses on the closed control loop for SLS assurance, because the definition of AssuranceGoal is based on serviceProfile and sliceProfile, and the attributes in serviceProfile and sliceProfile are mainly for SLS assurance.

At the meantime, there are several Rel-17 autonomous network related work items in SA5, such as ANL, IDMS, eMDAS, eSON, EE5GPLUS etc., these work items have identified many use cases supporting autonomous networks, some of the use cases or combination of these use cases may need continuous iteration steps to support autonomous network. For example:

1. In TS 28.100, the generic workflow for network optimization, RAN NE deployment and fault management are defined, when the autonomous network level reaches level-4 or level-5, there will be a closed control loop in the workflows. From the closed control loop governance point of view, the goal of the closed control loop needs to be expressed. And some targets of this kind of goals are not included in the existing serviceProfile and sliceProfile, for example, for the closed control loop of the fault management workflow defined in TS 28.100 clause 7.3.1, the targets of the goal can be the requirements derived from the fault management intent (e.g. reduce fault recovery response time to a certain value, reduce network and service failure times to a certain value within a specific duration), these kind of attributes are not included in the existing serviceProfile and sliceProfile, so how to express these kind of targets, e.g. to add these targets to serviceProfile or sliceProfile directly, or to enhance the definition of AssuranceGoal to include the targets not only from the serviceProfile or sliceProfile, needs to be studied.
2. In TS 28.310 and draft TS 28.104, the energy saving related use cases and solutions are defined. For autonomous network, a closed control loop of the energy saving workflow will also need to be performed continuously for the energy efficiency assurance of the network. Currently, there is an attribute energyEfficiency has been defined in serviceProfile and sliceProfile, which can be one of the targets of the goal. But the operator may need more targets for the governance of the energy saving closed control loop, for example, the policy about the balance between energy saving and service experience, etc., how to express these kind of targets also needs to be studied.

And from monitoring point of view, for the governance of closed control loop, the following issues need to be considered:

1. The consumer may need more detailed information of the closed control loop status, not only the controlLoopLifeCyclePhase defined in TS 28.536 which includes Preparation, Commissioning, Operation and Decommissioning.
2. The operator may need to know some information of the actions performed during the closed control loop, but for the closed control loop, some actions will be performed based on prediction, for example the Network deterioration prediction in task E of the network optimization workflow (see clause 7.1.1 of TS 28.100), fault prediction in task F of the fault management workflow (see clause 7.3.1 of TS 28.100), so there is no alarm notification and threshold crossing notification directly related with these actions, and the current definition of configuration notification does not contain the information of the action. So how to provide the appropriate approach for the consumer to get the information of the actions performed during the closed control loop needs to be studied.

So the existing closed control loop governance mechanism defined in eCOSLA cannot support all the existing closed control loops for the autonomous network related use cases collected in the existing autonomous network related specifications, it is proposed to study the closed control loops of the other use cases first, and check whether these use cases can be covered by the mechanism defined in eCOSLA. If some use cases can be covered by eCOSLA directly, but all other use cases can be covered by eCOSLA after enhancement, then a new WID to enhance the mechanism in eCOSLA is needed; and if some use cases cannot be covered by eCOSLA, even if eCOSLA is enhanced, then a new WID to define a new closed control loop governance mechanism is needed.

# 4 Objective

The objective of this study includes the follows:

1. Identify existing closed control loops which are not covered by eCOSLA based on the use cases or the combination of the use cases from the output of the existing autonomous network related work items (e.g. ANL, IDMS, eMDAS, eSON, EE5GPLUS);
2. Identify potential requirements to support the controlling (e.g. the goal and targets) and monitoring (e.g. the status of the closed control loop and the notification during the closed control loop) of the identified closed control loops, include but not limited the following closed control loops:
	* Closed control loop for Fault Management;
	* Closed control loop for energy efficiency assurance;
3. Study the potential solutions to support the identified potential requirements
4. Study the necessity and feasibility to reuse or enhance the current closed control loop controlling and monitoring mechanism in eCOSLA to support more autonomous network related use cases;
5. Derive recommendation for normative work item(s) if enhancement of eCOSLA and/or new mechanism for closed control loop governance is needed.

During the study, coordination with the work group or project in other SDOs (e.g. ETSI ZSM, TM Forum Autonomous Networks Project) may be needed.

# 5 Expected Output and Time scale

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| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| External TR | 28.9XX | Study on Closed control loop governance for autonomous network | Sep 2022 (SA#97) | Dec 2022 (SA#98) | Zhu Weihong, ZTE, as primary rapporteur for items 3, 4, 5; andChen Xiumin, China Telecom, as rapporteur for item 1, 2 |
|  |  |  |  |  |  |

{Note 1: Only TSs may contain normative provisions. Study Items shall create or impact only TRs.
"Internal TR" is intended for 3GPP internal use only whereas "External TR" may be transposed by OPs.}

{Note 2: The first listed Rapporteur is the specification primary Rapporteur. Secondary Rapporteur(s) are possible for particular aspect(s) of the TS/TR. In this case, their responsibility has to be provided as "Remarks".}

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |
|  |  |  |  |

# 6 Work item Rapporteur(s)

Zhu Weihong, ZTE, zhu.weihong@zte.com.cn

# 7 Work item leadership

SA5

# 8 Aspects that involve other WGs

Coordinate with ETSI ZSM, TM Forum Autonomous Networks Project where needed

# 9 Supporting Individual Members

{At least 4 supporting Individual Members are needed. There is an expectation that these companies will provide resources to progress the work. Note that having 4 supporting companies is a necessary but not sufficient condition: the usual TSG approval process by consensus is needed for the WID approval}

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| Supporting IM name |
| ZTE |
| China Telecom |
| China Unicom |
| CATT |
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