**3GPP TSG-CT3 Meeting #118-e *C3-215290***

**E-Meeting, 11th – 15th October 2021 (Revision of CP-211335)**

**3GPP TSG-CT WG4 Meeting #106-e** **C4-215220**

**E-Meeting, 11–15 October 2021**

**Source: China Mobile Communications Group Co.,Ltd., Ericsson**

**Title: Revised WID on Enablers for Network Automation for 5G - phase 2**

**Document for: Approval**

**Agenda Item: 17.1.1**

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: Enablers for Network Automation for 5G - phase 2

# Acronym: eNA\_Ph2

## Unique identifier: 910012

## Potential target Release: Rel-17

## 1 Impacts

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

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a Building Block.

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

### 2.2 Parent Work Item

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| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| FS\_eNA\_Ph2 | SA2 | 840022 | Study on Enablers for Network Automation for 5G - phase 2 |
| eNA\_Ph2 | SA2 | 900010 | Stage 2 of eNA\_Ph2 |

### 2.3 Other related Work Items and dependencies

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| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 760047 | Study of enablers for Network Automation for 5G | Antecedent Rel-16 stage 2 study item |
| 830047 | Enablers for Network Automation for 5G | Antecedent Rel-16 stage 2 Work item |
| 830009 | Enablers for Network Automation for 5G | Antecedent Rel-16 stage 3 Work item |

## 3 Justification

SA2 have worked on the services enabled by NWDAF and related network functions have been specified to support data collection, and provide analytics to consumers. The work has been carried out under the study item FS\_eNA\_Ph2(SP-200098) and completed by the approval of the 3GPP TR 23.700-91 within the Rel-17 version of 3GPP specifications. The conclusions of the 3GPP TR 23.700-91 provide a good overview of what is to be continued into normative phase and impacts to other working groups. The new Rel-17 WID on Network Automation – Phase 2 (eNA\_Ph2) in SP-200975 has been approved based on the study item conclusions. The work impacts interfaces and services under CT WGs responsibility and the related stage 3 work should be carried out within Rel-17.

- This work item aims at specifying interfaces and services enhancements that have been studied in stage 2 study item FS\_eNA\_Ph2 and further specified in stage 2 normative work eNA\_Ph2.

- This work item will also specify the how to implement Network data analytics procedures and signalling flows.

## 4 Objective

The objective is to specify the protocols and specifications required in order to fulfil system enhancements for NWDAF, which including architecture or framework enhancement (e.g. logical function decomposition of NWDAF, increasing efficiency of data collection, multiple NWDAF instances communication, UE data input via AF , user consent for UE data collection/analysis, trained ML model provisioning service, triggering conditions for the Data Analytics, and enhancement for real-time communication), extensions to existing Nnwdaf services (slice SLA enhancement, dispersion analytics, NWDAF-assisted UP optimization, NWDAF-assisted RFSP policy, UP optimization for edge computing, and adding application attributes to User Data congestion Analytics) and the signalling flows of Network Automation.

For CT3, the expected work will include analysis work on stage 3 protocol selection and details and the related normative work (non-exhaustive list):

- The signalling flows of Network Automation over the service-based interfaces and their relationship with the flow level signaling in 5G system;

- The Logical function decomposition of NWDAF (Model Training logical function, Analytics logical function) and the possible interactions between these logical functions i.e. ML Model sharing services provided by Model Training logical function;

- Support of trained ML model provisioning service;

- Increasing efficiency of data collection:

- Signalling reduction via parametrization and services changes;

- Bulk data collection;

- Potential definition for Persistent data collection base on the NWDAF event subscription

- Signalling reduction on Tracking and Discovery of Entities:

- Improve of AMF and SMF event exposure services;

- Improve of NWDAF to mute the event reporting;

- Signalling reduction via Event Exposure service enhancement;

- Enhancement on event Exposure for Analytics service;

- Enhancement on event Exposure for data collection;

- Signalling reduction via architectural changes;

- Support of Data Collection Coordination Functionality (DCCF) API(s), which may be used to coordinate collection and delivery of data;

- Support of Analytics Data Repository Function (ADRF) API(s), which may be used to store and retrieve collected data and analytics;

- Support of Messaging Framework Adaptor Function (MFAF) API(s), which may be used for analytics and Data collection;

- Support of multiple NWDAF instances:

- Multiple NWDAF architecture and Analytics aggregation;

- Re-selection of NWDAF;

- Analytics Subscription transfer and Analytics Context transfer;

- Specific aspects of NWDAF interactions (Time coordination, Abnormal Behavior analytics interactions and Exposing UE Mobility analytics);

- Support of UE data as an input for analytics generation;

- Enhancements to NF load analytics based on UE data collected via the AF;

- Support of User consent for UE data collection/analysis:

- Enhancement of NEF to support provision of user consent for UE data;

- Enhancement of NWDAF to support performing data collection and analytics generation depending on the existence (or not) of user consent for UE data;

- Support of triggering conditions for analytics;

- Enhancement for real-time communication between the NWDAF Service Consumer and the NWDAF within Supported Analytics Delay per Analytics ID;

- Support for Slice SLA enhancement;

- Enhancements of slice load level related data analytics;

- Support for slice load distribution mechanism;

- Support of dispersion Analytics output provided by NWDAF;

- Support of WLAN Performance analytics;

- Support of Session Management Congestion Control Experience Analytics;

- Support of Redundant Transmission Experience analytics;

- Support of DN Performance analytics;

- Support of NWDAF Assisted UP Optimization;

- Support of NWDAF-assisted RFSP policy;

- Support of UP optimization for edge computing; and

- Support of adding application attributes to User Data congestion Analytics.

For CT4, the expected work will include analysis work on stage 3 protocol selection and details and the related normative work (non-exhaustive list):

- The Model Training logical function registration, discovery and selection;

- Signalling reduction on Tracking and Discovery of Entities;

- Improve the NF profile stored in the NRF;

- Improve on UDM to store relevant per UE information to find serving NFs;

- Potential impact to support signalling reduction via Event Exposure service enhancement;

- Support DCCF, ADRF, and MFAF registration, discovery and selection;

- Enhancement on NRF and potential impact on UDM to support multiple NWDAF architecture;

- Support of User consent for UE data collection/analysis;

- Enhancement of UDM to support store the user consent for UE data collection as subscription information and retrieval of these data by other NFs; and

- Enhancement on NRF to extend NWDAF architecture for trained data model sharing between multiple NWDAF instances;

The tasks for each CT WG could be updated during stage 2 normative work.

NOTE: The introducing of new functionalities will be further identified in stage 2 work. Stage 3 work should be updated accordingly.

## 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 |
| TS | 29.552 | 5G System; Network Data Analytics signalling flows; Stage 3 | CT#94(Dec. 2021) | CT#95(Mar. 2022) | Zhang, XuefeiHuaweisummer.xuefei@huawei,com |
| TS | 29.574 | 5G System; Data Collection Coordination Services; Stage 3 | CT#94(Dec. 2021) | CT#95(Mar. 2022) | Zhang, XuefeiHuaweisummer.xuefei@huawei,com |
| TS | 29.575 | 5G System; Analytics Data Repository Services; Stage 3 | CT#94(Dec. 2021) | CT#95(Mar. 2022) | Huang, ZhenningChina Mobilehuangzhenning@chinamobile.com |
| TS | 29.576 | 5G System; Messaging Framework Adaptor Services; Stage 3 | CT#94(Dec. 2021) | CT#95(Mar. 2022) | Huang, ZhenningChina Mobilehuangzhenning@chinamobile.com |

NOTE: The new TS on protocol definition of the signalling flows for network data analysis will only describe the NFs and functionalities under CT3’s responsibility.

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| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| 29.503 | Impact on UDM related items. | CT#95(Mar. 2022) | CT4 responsibility |
| 29.508 | Impact on SMF for Event Exposure enhancement. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.510 | Impact on NRF related items. | CT#95(Mar. 2022) | CT4 responsibility |
| 29.513 | Cleanup the NWDAF procedures. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.514 | Potential impact on PCF Authorization Service. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.517 | Potential impact on AF event exposure. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.518 | Potential impact on AMF related items. | CT#95(Mar. 2022) | CT4 responsibility |
| 29.520 | Impact on NWDAF related items. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.522 | Impact on NEF related items. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.523 | Potential impact on PCF event exposure. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.554 | Potential impact on BDT policy control. | CT#95(Mar. 2022) | CT3 responsibility |
| 29.571 | Potential impact on new common data definition. | CT#95(Mar. 2022) | CT4 responsibility |
| 29.591 | Potential impact on NEF for event exposure. | CT#95(Mar. 2022) | CT3 responsibility |

## 6 Work item Rapporteur(s)

Huang Zhenning (China Mobile)

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## 7 Work item leadership

CT3

## 8 Aspects that involve other WGs

None.

## 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| China Mobile |
| Huawei |
| China Telecom |
| Nokia |
| Deutsche Telekom |
| Charter Communications |
| Verizon |
| Samsung |
| Ericsson |
| T-Mobile US |
| Nokia Shanghai Bell  |
| Intel |