3GPP SA WG1 Meeting #97e S1-22xxxx

Electronic Meeting, 14 Feb –24 Feb 2022

**Source: ZTE Corporation**

**Title: New study on 5G enabled Distributed Data Management**

**Document for: Agreement**

**Agenda Item: 4**

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: New study on 5G enabled Distributed Data Management

Acronym: DDM

Unique identifier:

Potential target Release: *{Rel-19}*

# 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 |  |  |  |  |  |
| Don't know | X |  |  | X |  |

# 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

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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

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
|  |  | {optional free text}  |

# 3 Justification

Distributed data management (DDM) is developed very fast in recent years. With this new technology deployed, the network can be more robust and reliable, e.g. when there is some wrong with one distributed data storage node, it will not cause service interrupt on whole aspect. On the hand, data monopoly can also be effectively avoided.

5G enabled DDM means distributed data storage in 3GPP network entities, real-time trustworthy data collection and sharing. In addition to inheriting the intrinsic benefit of DDM, it also has benefits to meet the demands of various IoT services, such as supporting millisecond even up to sub-millisecond data collection, the data can be wireless communication network measurement data and key IoT/V2X data from end equipments, furthermore, trustworthy data storage near to RAN and sharing them among multiple operators/service subscribers can satisfy the requirements in the case of RAN sharing deployments.

The 5G enabled DDM can be deployed for diverse IoT scenarios especially industry control, remote driving, AGV/IGV real-time monitoring etc. and also in network sharing scenario. For example:

* When robotic arms utilized in smart factory, it requires to collect real-time movement information. These movements and corresponding control commands require real-time collected, distributed stored and trustworthy shared among multiple service subscribers.
* In network sharing scenario, real-time millisecond-level cell load information and sub-millisecond-level latency of URLLC services are required to be collected and shared between participating and hosting operators. Furthermore, a neutral platform is required to support traceable data viewing, immutable data storage and trusted point-to-point transmission for operators to achieve trustworthy network sharing.
* Distributed data collection can also be used for network intelligence, which helps to reduce data transmission load and data privacy protection issues on the RAN side, and also improves AI model performance and delay issues

However, there are still challenges for 5G system to support DDM:

* In the existing 5G, RAN nodes have not been involved in the trustworthy data sharing circle. Therefore, 5G system doesn’t yet fully support trusted data storage and sharing;
* The data collection can’t support real-time collection, e.g. millisecond even up to sub-millisecond level;
* The collected data type is limited on communication measurement data, thus it can’t support diversified IoT scenarios.

Considering the above analysis, it is proposed to study 5G enabled DDM related use cases and potential requirements in Rel-19.

# 4 Objective

The objective of this technical report is to study use cases and identify potential requirements for 5G enabled distributed data management. It includs but is not limited to:

- Use cases related with 5G distributed data management

- Distributed data storage scenarios e.g. smart factory, ITS, V2X, network sharing etc.

- Real-time data collection and multiple data sources.

- Trustworthy data sharing supported by RAN nodes.

- Potential requirements to enable distributed data storage, real-time trustworthy data collection and sharing. The collected data includes wireless network related measurements, and key IoT/V2X data from related end equipments to RAN nodes.

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| Internal TR | 22.XXX | New study on 5G Enabled Distributed Data Management | TSG#98(Dec 2022) | TSG#99(Mar 2023) | xxx, ZTE Corporation; |
|  |  |  |  |  |  |

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

# 6 Work item Rapporteur(s)

xxx, ZTE Corporation, xxx <at> zte.com.cn

# 7 Work item leadership

SA1

# 8 Aspects that involve other WGs

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# 9 Supporting Individual Members

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| Supporting IM name |
| ZTE Corporation |
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