**3GPP TSG-SA WG1 Meeting #108 S1-244522**

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Title: Use case on big events assurance

Agenda Item: 8.1.7

Source: ZTE

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*Abstract: <provide a short description of the content>*

*This contribution proposes a new use case about big events assurance, which uses AI agents in 6G network to integrate the communication knowledge, structured data and network atomic capabilities to achieve the big event assurances.*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* First change \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

 AI Agent: an intelligent (e.g. Large Language Model, Vision-Language-Action Model) functionality capable of performing certain tasks (e.g. cognition including understanding Intents and sensed environments, planning, decision-making, utilizing tools) by itself or in collaboration with other AI agents without human intervention. AI agent can be deployed in an end device (e.g. UE, intelligent robot and intelligent car), or in network nodes (e.g. network intelligent assistant).

Editor note: The definition of AI agent will be updated to align with the agreement.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* New Use Case \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## W.x Use case on big events assurance

### W.x.1 Description

An artificial intelligence (AI) agent refers to a functionality that is capable of autonomously performing tasks on behalf of a user or a system by designing its work-flow and utilizing available tools. In addition to the natural language processing, AI agent can perform decision-making, problem-solving, and executing actions. AI agent can be used in 6G network to solve complex tasks such as big event assurance.

The big events, such as Olympic games, concerts, marathon, etc., usually poses stringent requirements for network performance. Large concurrent users, big volume data transmission and frequent real-time operations are assumed. With Asian games in 2022 as an example, there are 48 matches and 1.5million users over 16 days. Moreover, the big event such as technology expo, trade fair, or corporate gathering, may be held within an industrial park. In these cases, there are a lot of participants of the event, including exhibitors, visitors, and staff. The network performance requirement is higher than usual. During these events, full network coverage, good user experience, and zero complaints are expected.

In order to provide the desired network performance, AI agent can be used to integrate the communication knowledge, structured data and network atomic capabilities to achieve the big event assurances. For example, operational team or customers of third party may raise the big event assurance task and requirements, the service types, bandwidth requirement, the number of users that needs to be supported, etc. Through the multi-modal human-computer interaction, user agent can understand user intent, decompose the user intent into several sub-tasks and calling service agents. The service agent makes action plan for efficient network configuration and resource allocation, personalized guarantee of user experience, real-time performance KPI monitoring, network coverage and interference evaluation, risk prediction and avoidance, alarm and root cause analysis, etc. Finally, resource agents may execute the specific action by using various tools, including built-in tools, API interfaces, models, etc., to complete given sub-tasks step by step.

Based on the assistance of multi-agent collaboration in 6G network, it is expected that the network performance requirement can be fulfilled and the labor workload can be reduced.

### W.x.2 Pre-conditions

National game will be held with millions of athletes and visitors. Operator A is responsible for the communication service provision with 6G network around the national game area. Operator A has realized the AI agent for the efficient 6G network operation and maintenance. Various AI agents are created when the 6G network is deployed.

### W.x.3 Service Flows

1. Before the national game, the operation team inputs the requirements that national game needs to be prepared, such as the service types, bandwidth requirement, and the number of users, etc.
2. Upon receiving such input, the user intent is analyzed by AI agent and divided into several sub-tasks. The sub-tasks may cover efficient network configuration, personalized guarantee of user experience, real-time performance KPI monitoring, risk prediction and avoidance, etc.
3. Each AI agents for sub-tasks will make detailed action plan for the sub-tasks. The action plan will be evaluated and tested until it works smoothly before the national game.
4. During the game, AI agents involved in the big event assurance take actions to provide the autonomous network operation. Moreover, the operation team creates the monitoring dashboard so that the status of user experience and network performance can be continuously monitored.
5. If pre-warning is received during the game, the corresponding AI agent can make optional solution based on pre-set intents. If this solution is evaluated as feasible, the network re-configuration will be carried out by AI agents automatically.

### W.x.4 Post-conditions

With the intelligent AI agents from all domains, the network performance can be assured and workload on complex routine network configuration and risk prediction/avoidance can be reduced.

### W.x.5 Existing features partly or fully covering the use case functionality

In TS 22.261, clause 6.51.2 on monitoring of network elements interactions in 5G include the following requirements:

NOTE 1: The monitoring system is outside of the 5G network. Both the monitoring system and the monitored network elements in the requirements below are fully under the control of the MNO.

The monitored network elements in the 5G network shall support the transmission of a secured copy of the outgoing and incoming signalling traffic to a monitoring system.

The 5G network shall enable the MNO to configure network monitoring, e.g., switching on/off per network element, selecting what type of elements and what type of signalling from these elements is the target for monitoring.

The 5G network shall allow the monitoring (i.e., transmit secured copies of outgoing and incoming signalling traffic) of a transmitting network element and, separately, the monitoring of the receiving network element while facilitating correlation of the information received from both network elements by the external system.

NOTE 2: These requirements do not imply/assume any design of the network elements. How the copies are created within the element, e.g., physical, virtual or container based, is expected to be implementation specific.

The signalling traffic shall be securely transmitted from the monitored network elements of the 5G network to the monitoring system while minimizing the degradation of network performance.

NOTE 3: The monitoring system is not integrated with the key management scheme of the 5G core.

The transmission of signalling traffic from the monitored network elements of the 5G network to the monitoring system shall be compliant with privacy legislation, data protection regulations and protection of confidential system internal data.

The transmission of signalling traffic from the monitored network elements of the 5G network to the monitoring system shall be limited regarding the number of file formats (e.g., JSON, PCAP, etc.) to assist with the ingestion of traffic feeds.

### W.x.6 Potential New Requirements needed to support the use case

[PR.w.x.6-1] Subject to operator’s policy and user consent, the 6G system shall be able to support AI agent to provide desired network performance.

[PR.w.x.6-2] Subject to operator’s policy and user consent, the 6G system shall be able to support AI agent to understand the user intent and divide the user intent into several sub-tasks.

[PR.w.x.6-3] Subject to operator’s policy and user consent, the 6G system shall be able to support multiple AI agents collaboration to complete the sub-tasks automatically.

[PR.w.x.6-4] Subject to operator’s policy and user consent, the 6G system shall be able to support the AI agent to monitor the real-time network performance and user experience.