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**New use case title:** **New use case on flexible UE-Network coordination through AI agent(s)**

**Draft TS/TR: 3GPP TR 22.870 v0.3.1**

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*Abstract: This contribution proposes a new use case on flexible UE-Network coordination through AI agent(s) to TR 22.870 V0.3.1.*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

Editor's Note: all References numbers to be corrected, missing references to be added

[X1] 3GPP TS 24.501: “Non-Access-Stratum (NAS) protocol for 5G System (5GS)”.

[X2] 3GPP TS 24.368: “Non-Access-Stratum (NAS) configuration Management Object (MO)”.

---------- Use Case template ----------

## 6.x Use case on flexible UE-Network coordination through AI agent(s)

### 6.x.1 Description

One of the goals of developing 6G system is to support an increasing number of diverse terminal devices leveraging not only connectivity but also advanced capabilities beyond basic communication (e.g., sensing, computing, and location). Examples include cars, UAVs/unmanned aircraft, robots/AGVs, lightweight wearable devices, low-power IoT devices, etc. These devices have different capabilities and functionalities, and different expectations on network services, which may lead to a fragmented design on service interaction, e.g., specialized capability negotiation, dedicated service discovery or invocation operation (e.g., Nnef\_UAVFlightAssistance operation in TS 23.256 dedicated for UAV) and specific UE configuration.

Besides, the current service provision paradigm of network relies heavily on the consumer side (including applications and UE) to understand what services can be invoked in advance. In certain scenarios, spatial and temporal information must also be considered by the UE side, e.g., sensing-related services may be associated with specific areas, communication and power saving-related plan is associated with coverage condition. This all cause challenges for enabling flexible and user-friendly service provisioning and UE-network interaction.

A possible way to alleviate this issue is to enable more generic UE-network coordination with emerging agentic AI technologies, which are expected to power the network with greater autonomy in predicting, perception and understanding of UE side context. On the one hand, AI agents can allow more flexible coordination and interaction (e.g., through human languages) and also support a universal mechanism for communication with diverse terminals at the service layer. On the other hand, the capability to memorize, reason and learn from additional knowledge could make AI agents capable of actively identifying appropriate services, policies or configurations for the terminals in a certain location and time period and proactively pushing service recommendations to the UE side.

### 6.x.2 Pre-conditions

User A is traveling to city X for a vacation. He has subscribed to operator O’s services, and both his car and AR glasses are connected to operator O’s network.

Operator O has AI agents running in its network to expose and provide services to terminals, including cars and AR glasses. And the AI agent knows what services are available in city X, and which services are accessible for specific types of terminals.

### x.3 Service Flows

The service flow is shown in Figure 6.X.3-1 as follows:



a) A service access AI agent in network perceives the user A moving into city X by vehicle. City X has deployed sensing service for smart transportation.



b) As the car accesses the network and moves along the road, the service access AI agent in network perceives this and proactively pushes a sensing service recommendation to the car for sensing-assisted (automatic) driving.



c) User A accepts the sensing service to enable advanced autonomous driving, which can utilize sensing information beyond line of sight (e.g., sudden road congestion, traffic participants present in blind spot, etc.) from the network.



d) After checking in at the hotel, User A decides to take a city walk and wears a pair of AR glasses to access a virtual tour guide service. Upon connecting to the network, the AR glasses may receive a notification from service access AI agent about available computing services.

 

e) The AR glasses negotiate with a computing service AI agent in the network to offload computing tasks (e.g., image rendering, object recognition and LLM-based Q&A) on demand. This offloading may dynamically adapt based on the device’s battery level, GPU/NPU performance, and communication quality.

 

f) As User A travels to crowded areas for sightseeing, a policy AI agent in the network may provide a communication quality map and path recommendations to ensure a sustained communication experience. Additionally, the AI Agent may offer a VIP service package recommendation to increase User A’s Quality of Service (QoS) priority during the trip.

**Figure 6.X.3-1: UE-Network Coordination for Connectivity and Beyond Connectivity Services**

1. User A drives his car into city X.
2. The service access AI agent in the network finds A’s car is in city X. Considering that A is a visitor and that city X is usually very crowded, and given that sensing service is available in the region, the service access AI agent sends a notification to A’s car about the availability of this sensing service, and tells it could help travelers like A to drive the car more safely.
3. User A thinks it’s good to have additional safety assurance and accepts to use the sensing service from operator O. User A may also enable autonomous driving mode of the car.
4. The service access AI agent receives the confirmation, and coordinates with the car about the details of the sensing service. For example, the car may report its current location and selected path to the sensing service AI Agent, and the sensing service AI Agent provide sensing information beyond line of sight (e.g., sudden road congestion, traffic participants present in blind spot near the car, etc.) to the car for better safety and driving experience.
5. The user A drives safely to the hotel, he checks in and decides to have a city walk wearing his AR glasses.
6. After connecting to the network, the service access AI agent finds A’s AR glasses’ performance could be enhanced by the computing service provided in city X’s region, so it sends a notification to A’s AR glasses about it.
7. With the user A’s permission, the AR glasses could then coordinate with the network about how to use the computing service.
8. For example, the AR glasses could provide a list of the applications that are potential to be accelerated/offloaded to the computing service AI agent. And the computing service AI agent could respond with a filtered list to the AR glasses, as a recommended configuration for the AR glasses to judge whether to request computing services when needed. The computing service AI agent could make the decision considering the location of A, capabilities of the AR glasses, network status, etc.
9. When the user A walks to an area where network status is not good, the computing service AI agent may send a warning about potential service downgrade to the AR glasses, and update the configuration of the recommended applications to be accelerate/offloaded. As a result, the AR glasses may decide to run more applications locally, and reduce the request of computing services. Besides, when User A travels to crowded areas for sightseeing, the service access AI agent may coordinate with a policy AI agent to provide a communication quality map and a path recommendation to user A, to help user A maintain a sustained good communication experience. Additionally, the policy AI agent may offer a VIP service recommendation to guarantee User A’s QoS priority. If User A accepts the recommendation, the policy AI agent will update QoS parameters to prioritize the connection of use A.

### 6.x.4 Post-conditions

Operator O could promote suitable services to various types of new devices, and the services operate efficiently. And user A gets a better experience through these services.

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

3GPP system supports mechanisms to update UE configuration by network, e.g., through OMA device management protocol, capability negotiations and service level (e.g., LCS service) interaction between UE and network, as defined in TS 24.501 and TS 24.368. However, it relies on proper implementation on UE side and is not flexible enough to enable potential new services.

### 6.x.6 Potential New Requirements

[PR 6.x.6-2] Subject to operator policy and user consent, the 6G network shall be able to optimize the user experience by actively informing UE about availability of related network services, providing service or policy recommendations, or offering service packages, based on information related to UE, subscription information ,etc.

NOTE: Examples of the information related to UE include the device type, device location, mobility behaviour, connection status, etc.

[PR 6.x.6-4] Subject to operator policy, the 6G system shall support dynamic configuration of UEs and the associated 3GPP services (e.g., communication service, sensing service, computing service, AI service) to adapt to varying conditions (e.g., network conditions, application needs, resource availability) to ensure optimal service operation.

NOTE: The optimal service operation aims to deliver network services efficiently and effectively, maximizing user satisfaction while minimizing costs and resource utilization.