

Optimizing and simplifying SIP-based NGNs' QoS architecture

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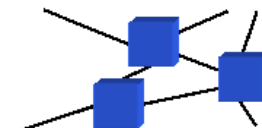
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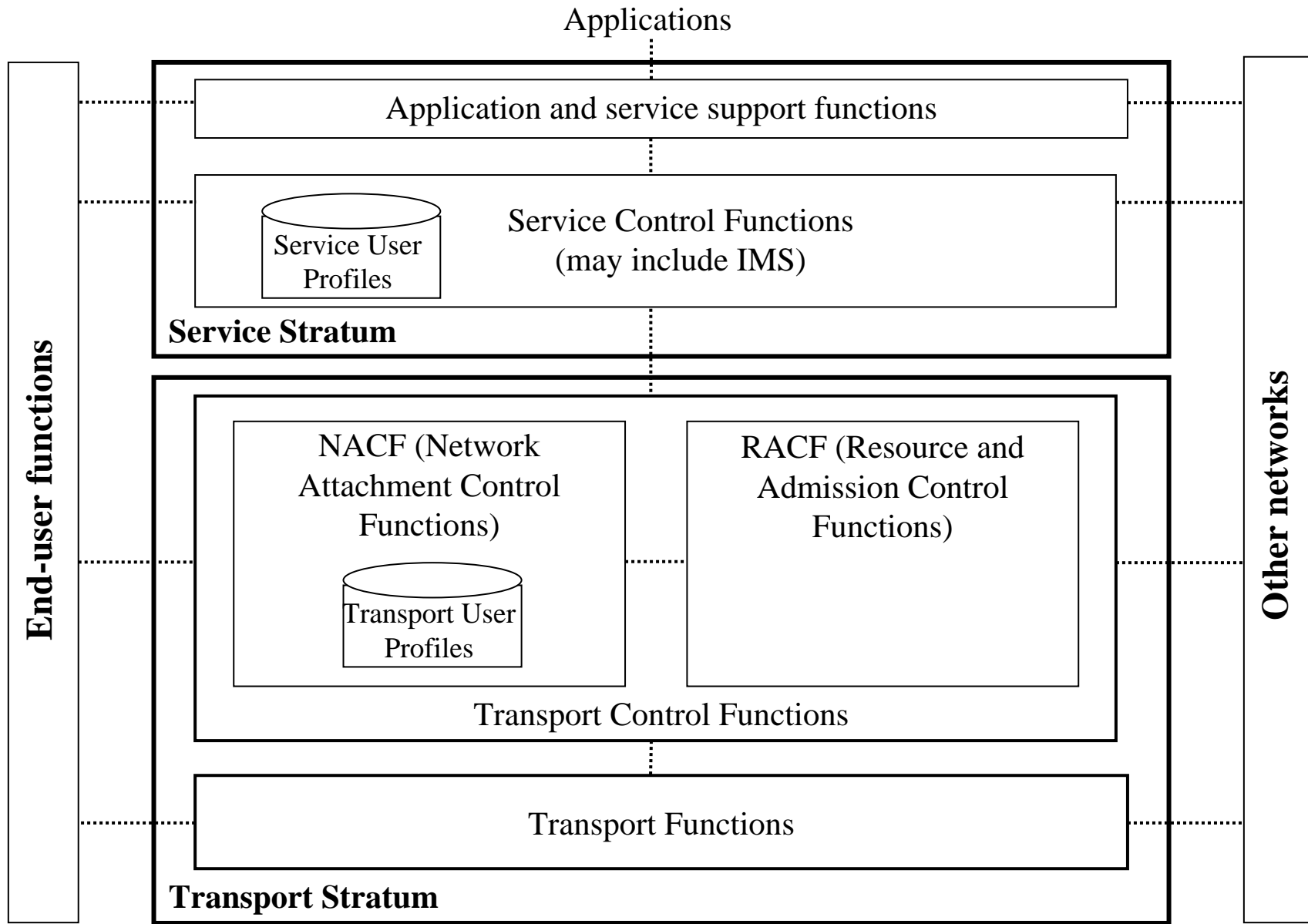


Optimizing and simplifying SIP-based NGNs' QoS architecture

- 1 NGN QoS architecture according to standardization**
- 2 Fundamental requirements to QoS management in SIP-based NGN**
- 3 Integrated framework for comprehensive QoS control in NGN**
- 4 Advantages**

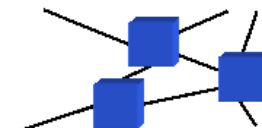


NGN QoS architecture according to standardization



Functions and effects of standardized NGN QoS architecture

- **Allocation/reservation of resources for media streams on IP transport layer**
→ signaling „from top to bottom“ required
- **Overall amount of traffic to be generated for QoS/resource control in NGN depends on**
 - * **Network characteristics** (network dimensions and topology, transport technology, implemented QoS mechanisms)
 - * **Number of users**
 - * **User behavior** (number of sessions per time per user, average session duration etc.)
- → **Amount of QoS/resource control traffic is influenced by factors not efficiently controllable by service providers**
- → **Standardized NGNs‘ QoS control does not scale (necessarily)!**



Fundamental requirements to QoS management in SIP-based NGN

- **Functions and mechanisms needed to provide trustworthy QoS for media sessions more efficiently/scalable**
- **End-to-end QoS control, independent of transport technologies/QoS mechanisms in access and core networks**
- **Simple and resource saving QoS control/management approaches, based on standardized protocols and architectures**
- **Both, session-based multimedia services and non-session-based services (e.g. email and www access) should be accessible within the same network. NGN QoS control must consider traffic that is not session-based**

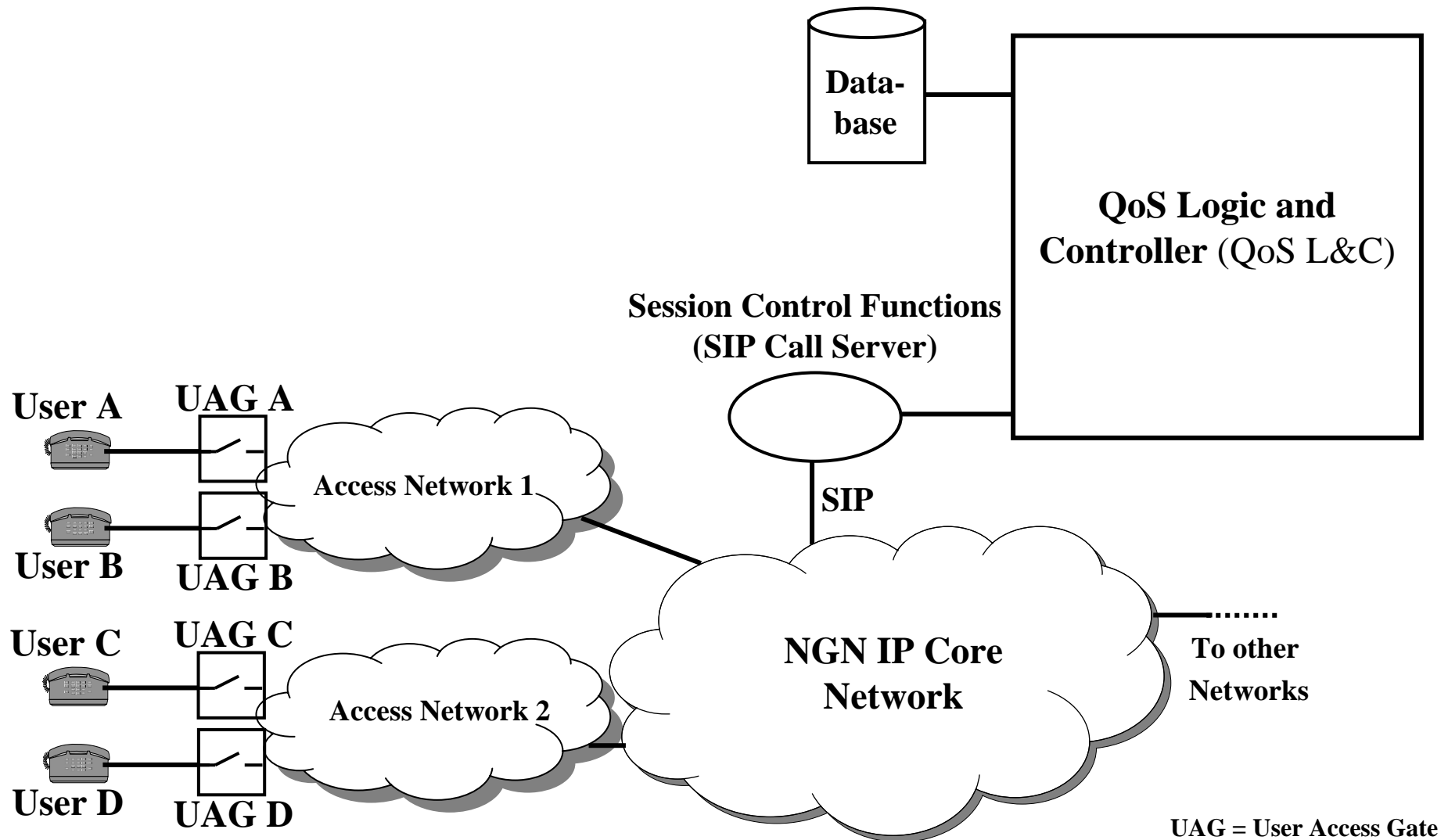


Tasks to be fulfilled by solution framework

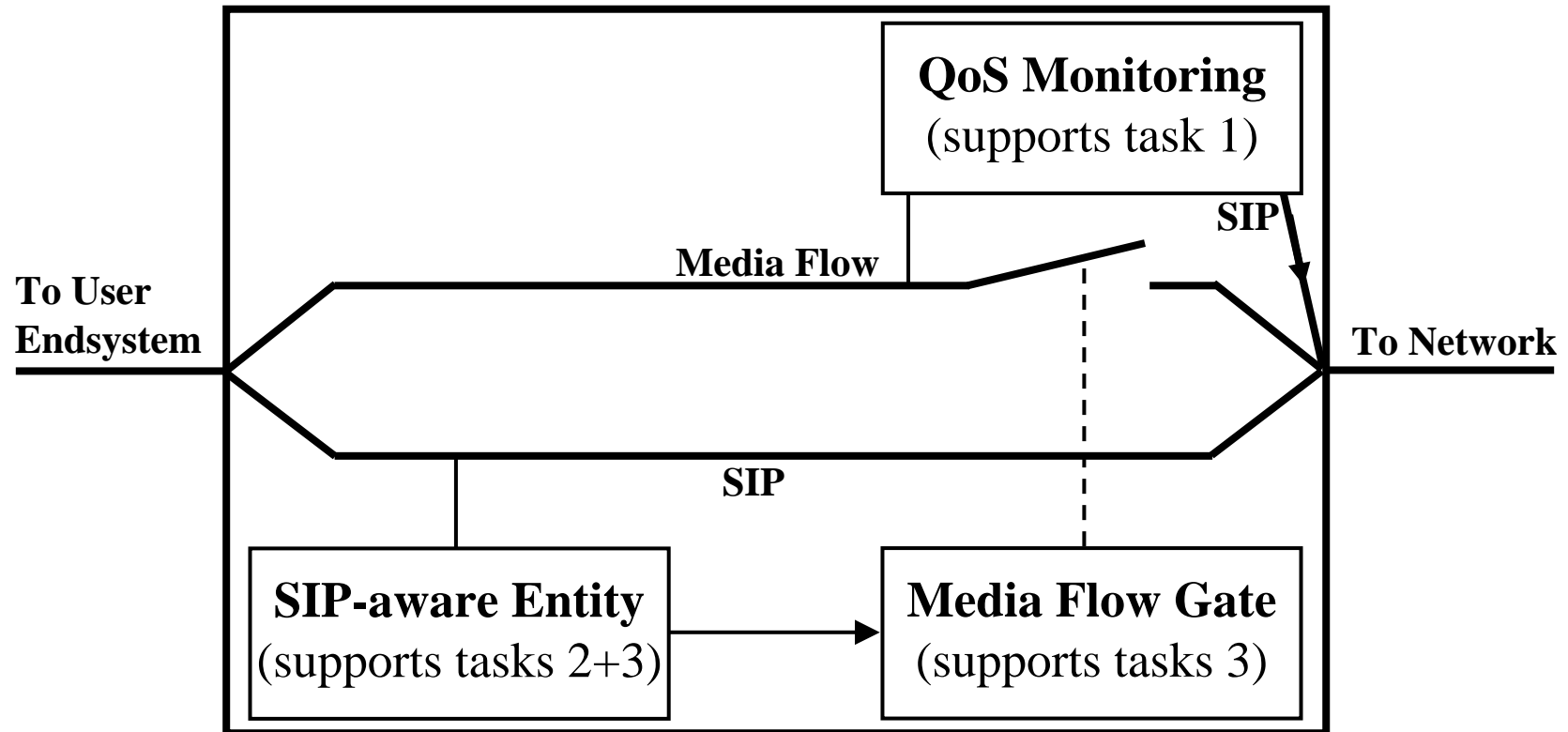
- **Main prerequisites for satisfaction of requirements: any task fulfilled causes only a minimum of additional traffic and must be scalable with number of users and network characteristics**
- **Task 1: Continuous ascertainment (and near future prediction) of End-to-End QoS conditions**
- **Task 2: Support and assistance of admission control for SIP-based services (→ Advanced Admission Control)**
- **Task 3: Manipulation of QoS conditions within the network (→ QoS control)**



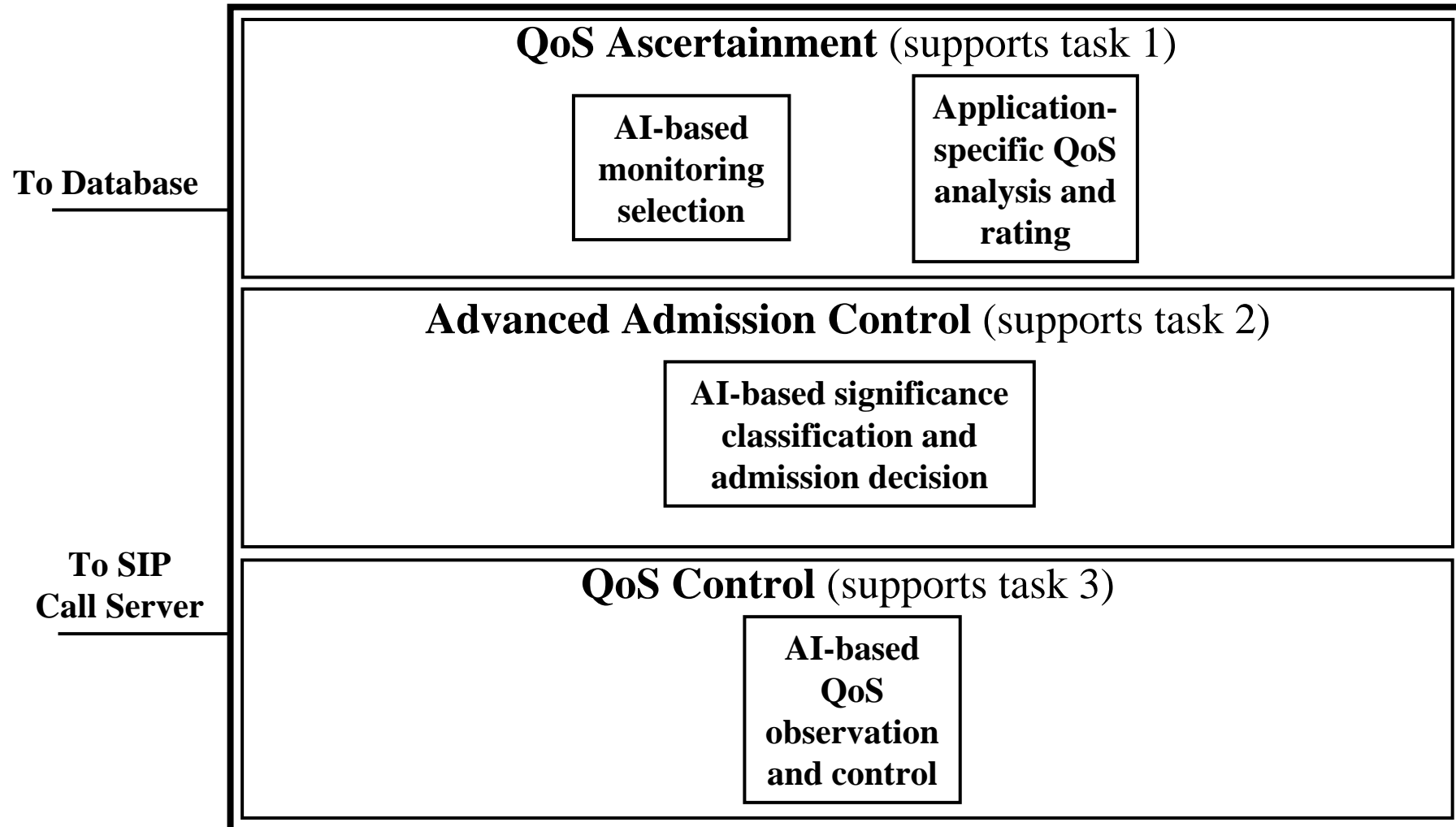
Integrated framework for comprehensive QoS control in SIP-based NGN



User Access Gate (UAG)



QoS Logic and Controller (QoS L&C)



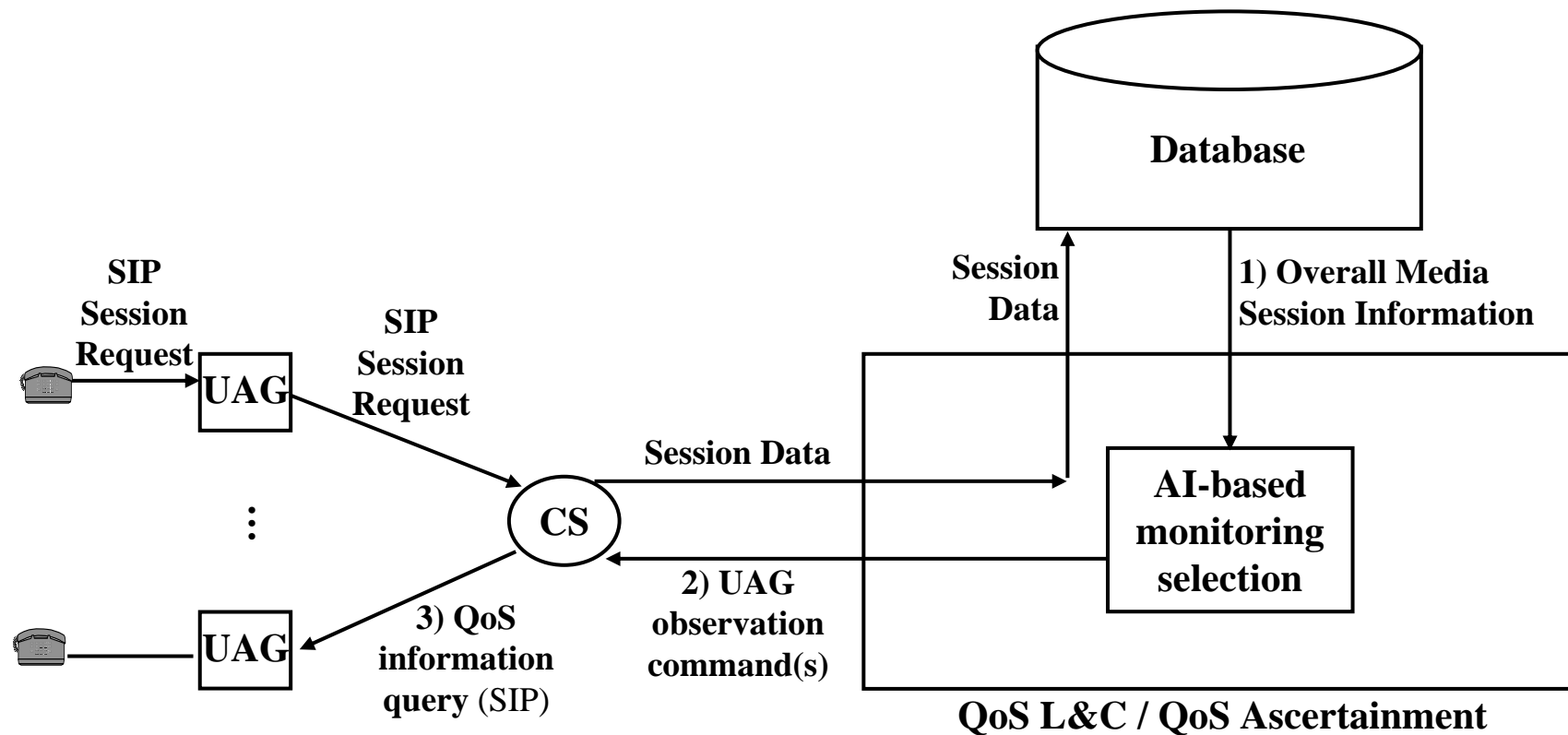
AI = Artificial Intelligence



Task 1: Ascertainment of QoS conditions

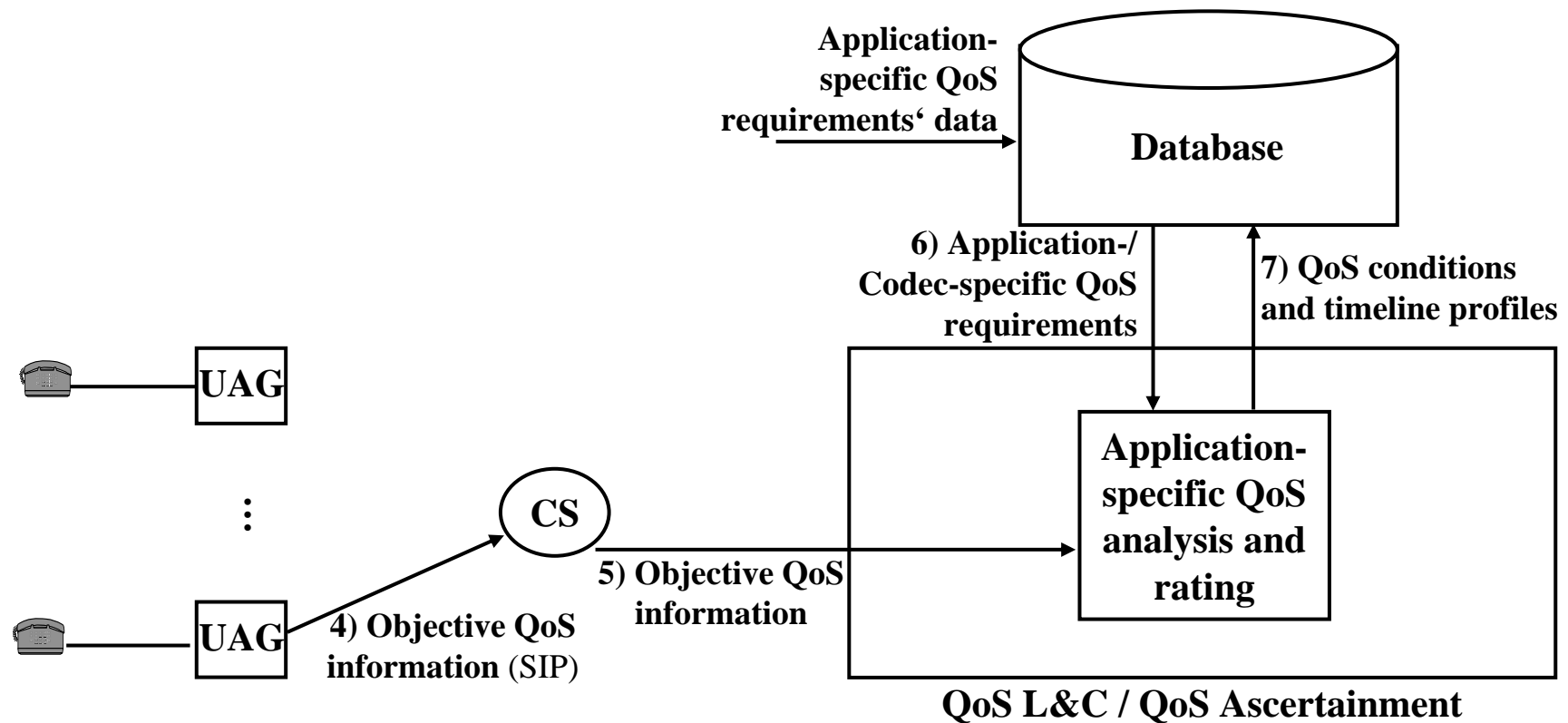
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- **Monitoring of QoS conditions for selected media sessions, each representing statistical QoS condition given for all media sessions with comparable characteristics (medium, codec, network segments, ...)**



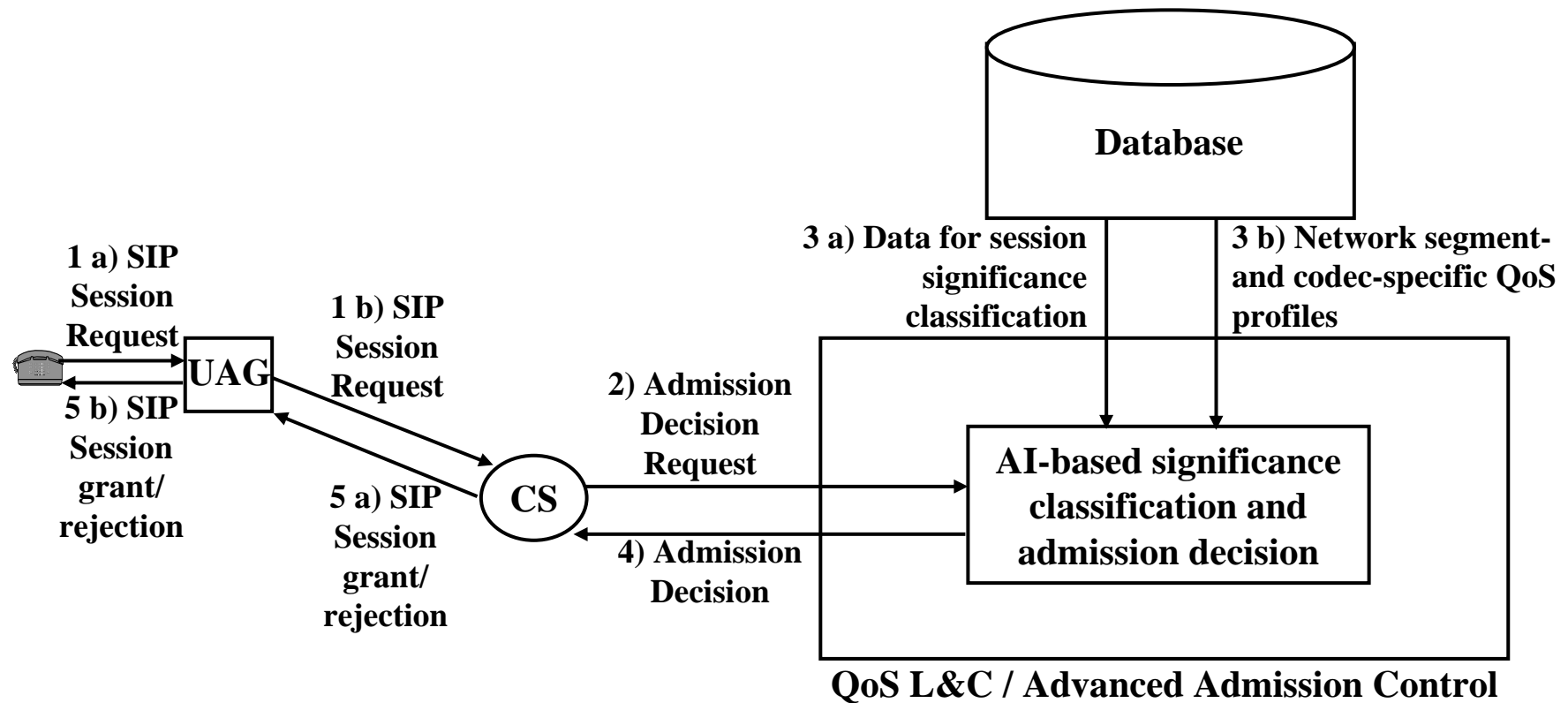
Task 1: Ascertainment of QoS conditions

- Deriving media-dependent QoS conditions by rating general QoS values (jitter, packet loss), based on codec-specific QoS requirements.



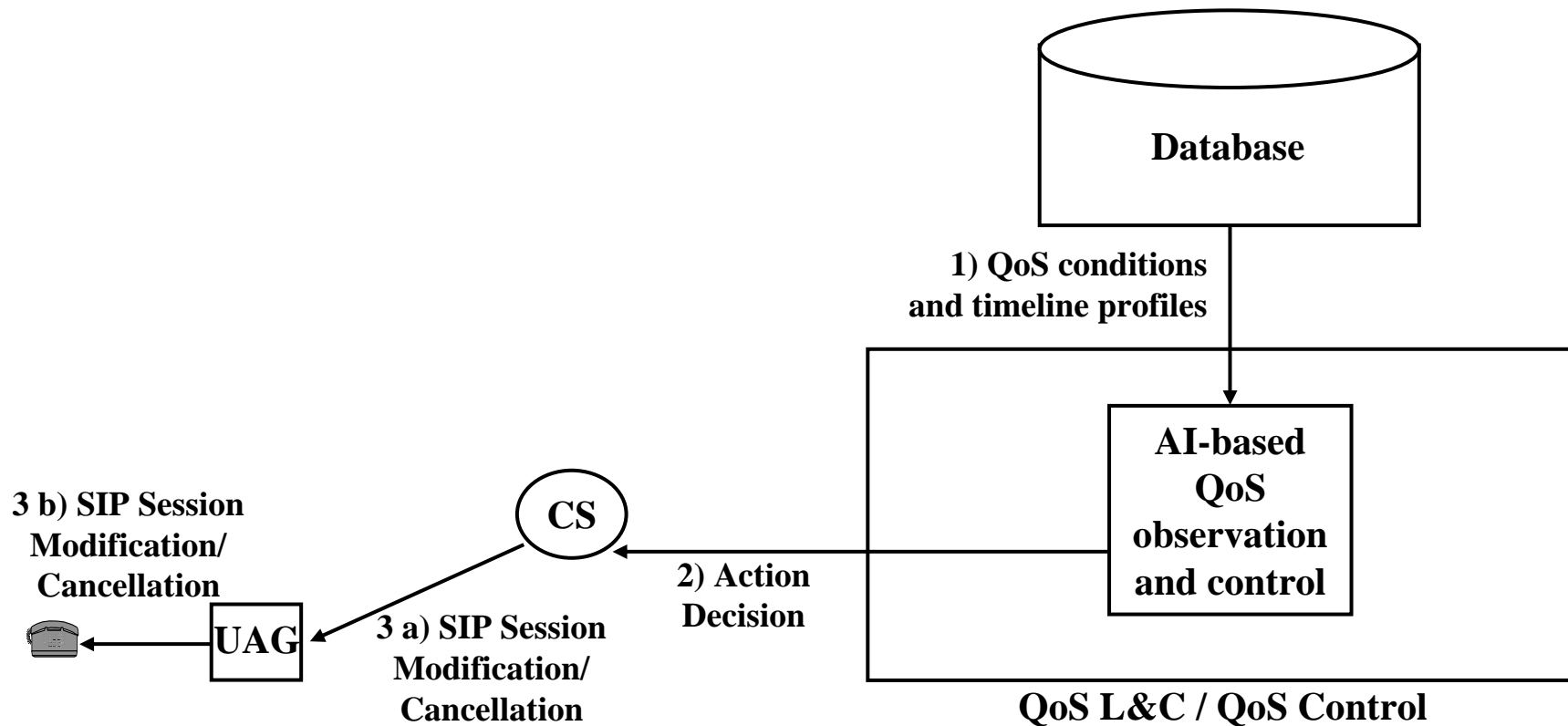
Task 2: Advanced Admission Control

- Considering objective session significance and QoS interdependencies with concurrent media sessions. Allows for manipulation of concurrent media sessions.



Task 3: QoS control

- Continuous observation of overall QoS conditions. Identification of QoS shortages and AI-based decision on required action.



Advantages

- **Benefits and innovations of the integrated framework for comprehensive QoS control in SIP-based NGN**
 - * **Non-intrusive End-to-End QoS monitoring and observation**
 - Supersedes additional passive QoS monitoring by NGN SIP service providers and network operators
 - * **AI-based selection of QoS monitoring points**
 - Avoidance of redundant QoS monitoring traffic
 - * **Subjective (media- /codec-specific) QoS rating, matching objective QoS information with universally valid application-specific QoS requirements**
 - * **AI-based Advanced Admission Control, considering objective session significance and effective QoS conditions**
 - Optimization of service availability and resource utilization
 - * **AI-based QoS Control**
 - Optimization of QoS conditions

