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Part 2: Proxy model-based quality of service

Télécommunications et échange d'informations entre systèmes — Futurs protocoles et mécanismes de réseau —

Partie 2: Qualité de service basée sur un modèle de proxy

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Foreword

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Introduction

This document and ISO/IEC 21558-2 both pertain to the Future Network (FN), which is a broad concept and has a wide application. The FNProxy technology introduced by ISO/IEC 21558-2 enables the future network quality of service (FNQoS), which makes the FNQoS appear to be a mutual relationship between intelligent FNProxies (i.e. harmonization between machines), not like the micro effect of traditional QoS which depends on parameters.

The fact that FNProxy can promote the evolution of QoS to harmonize the process of networking. It provides new forms of networking besides new concepts of QoS. This can lead to the emergence of new industry trends in the field of systems interconnection technology.

This document specifies three engines (perception, negotiation and execution) to support the effective work of FNProxy. This document also describes protocol mechanisms for synchronous interaction between two FNProxies and among multiple FNProxies. Also, conditions and requirements for service transitions between/among FNProxies are described. Annex A gives the quantitative calculation method (harmonization between FNProxies) of interaction QoS effect, which can be used as a starting point reference for developers to improve the calculation method.

Duo to the intelligence of FNProxy, synchronous interactions of Bidirectional Service (Bi-S) between FNProxies have more extensive effects. Bi-S is necessary: a fundamental methodology, tool, and idea to analyse and develop FNQoS systems.

This document explains in detail the protocol mechanisms of FNProxy interactions from two perspectives: 1) the basic FNQoS system (BFS) 2) synthetic FNQoS system (SFS).

This document stipulates that protocol mechanisms can be used for all networks for transmission purposes, and also for generalized networks, such as the implementation of semantic network protocol mechanisms. The development of various network technologies based on Artificial Intelligence Enabled Networking (AIEN) is recommended.

This document stipulates that the purpose of interactions between FNProxies can be either transmission interactions or content interactions.

The protocol mechanism specified in this document is applicable to ISO/IEC TR 29181-8 and ISO/IEC 21558-2.

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Telecommunications and information exchange between systems — Future network protocols and mechanisms —

Part 2:
Proxy model-based quality of service

1 Scope

The concept of this document considers the FNQoS related to the FNProxy based in ISO/IEC TR 29181-8.

The protocol mechanism given in this document supports both the interaction between two FNProxies of a basic FNQoS system (BFS) and the interaction among multiple FNProxies in a synthetic FNQoS system (SFS).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 21558-2, *Telecommunications and information exchange between systems — Future Network — Architecture — Part 2: Proxy Model based Quality of Service*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO/IEC 21558-2 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 Terms and definitions

3.1.1
service transition
FNProxy transfers the requirements that it cannot serve to the corresponding FNProxy

Note 1 to entry: FNProxy service transition must be based on the FNProxy's own strategy and real-time information.

Note 2 to entry: That the direction of service transition can also be determined by the information of Bi-Ss (FNProxy link pairs) stored in the *FNProxy Interaction Bridge (FIB)* (3.1.2) of the FNQoS system. By default, the transition direction is based on the information stored in FIB.

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3.1.2
FNProxy Interaction Bridge
FIB
linking path of two FNProxies in SFS

Note 1 to entry: It includes logical paths to realize the interactive exchange of information between any two FNProxies in a synthetic FNQoS system (SFS) consisting of bidirectional service (Bi-S) pairs by cascading.

3.1.3
FNProxy Link Mode
FLM
FNProxy linking template

Note 1 to entry: It is used to normalizing the design, evaluation and calculation of binding, identification, registration, management, bidirectional service (Bi-S) and negotiation for different styles of FNProxy link in a synthetic FNQoS system (SFS).

Note 2 to entry: Several FLMs are listed in Annex D. When FLM is used by the designer, it means that the transition direction of the FNProxy is not random but known in advance. The negotiation strategy (NS) of the FNProxy will set the requirement type percepting function of the perception engine of FNProxy to sleep.

3.1.4
FNProxy Protocol Data Unit
FPDU
data unit needed by the interaction between two FNProxies in an FNQoS system

3.1.5
BFS Protocol
BFSP
set of FPDU fields, semantic changes and timing needed by all procedures supported by the two FNProxies of BFS

3.1.6
SFS Protocol
SFSP
set of FPDU fields, semantic changes and time sequence of all procedures among all FNProxies in a SFS

3.1.7
FNProxy Strategy
FNPS
predetermined response of FNProxy

Note 1 to entry: It is for some important states or comprehensive effects of an FNQoS system based on the environment of FNQoS system, the characteristics and capability of the FNProxy, the target of the FNProxy owner and the real-time running status of the FNProxy.

Note 2 to entry: The FNProxy Strategy (response measures, scheme) and its solutions (sub schemes) are stored in the FNProxy Strategy Base (FSB).

3.1.8
procedure
interaction sequence between FNProxies to complete the special tasks in the FNQoS system

Note 1 to entry: The comprehensive effect of FNQoS system consists of several procedures dynamically. It is generally expressed in the form of a sequence diagram.

3.2 Abbreviated terms

AI	Artificial Intelligence
AIEN	Artificial Intelligence Enabled Networking

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