

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Series Q
Supplement 58
(01/2008)

SERIES Q: SWITCHING AND SIGNALLING

Organization of NGN transport user data

ITU-T Q-series Recommendations – Supplement 58



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Supplement 58 to ITU-T Q-series Recommendations

Organization of NGN transport user data

Summary

This supplement provides NGN transport user data while defining its structure with the parameters, incorporating those defined in ITU-T Recommendation Y.2014. Those categorized here are transport user profile identification, access identification, location management, transport resource subscription, default configuration, access authentication, identification of other functional entities, mobility and event management.

Source

Supplement 58 to ITU-T Q-series Recommendations was agreed on 23 January 2008 by ITU-T Study Group 11 (2005-2008).

Keywords

NGN, transport user data, user data.

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Supplement 58 to ITU-T Q-series Recommendations

Organization of NGN transport user data

1 Scope

The scope of this supplement is to define data structure and parameters information of transport user data.

1.1 Relationship

Work for this supplement is based upon the context of [ITU-T Y.2014] and [ITU-T Y.2012]; this supplement complies with the information model and message exchanged between transport stratum FEs which are specified in [ITU-T Y.2014], and the functional requirements and architecture specified in [ITU-T Y.2012].

2 References

- | | |
|----------------------|---|
| [ITU-T Y.2011] | ITU-T Recommendation Y.2011 (2004), <i>General principles and general reference model for Next Generation Networks</i> . |
| [ITU-T Y.2012] | ITU-T Recommendation Y.2012 (2006), <i>Functional requirements and architecture of the NGN release 1</i> . |
| [ITU-T Y.2014] | ITU-T Recommendation Y.2014 (2008), <i>Network attachment control functions in next generation networks</i> . |
| [ITU-T Y.2000-Sup.1] | ITU-T Y.2000-series Supplement 1 (2006), <i>ITU-T Y.2000 series – Supplement on NGN release 1 scope</i> . |
| [ETSI TR 182 005] | ETSI TR 182 005 V1.1.1 (2006), <i>Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Organization of user data</i> .
[< http://pda.etsi.org/pda/home.asp?wki_id=WDkj2.LPTSLNMPLUFzFDI >] |
| [ETSI ES 282 004] | ETSI ES 282 004 (2008), <i>NGN Functional Architecture; Network Attachment SubSystem (NASS)</i> .
< http://pda.etsi.org/pda/home.asp?wki_id=np'.xPHv85iknoik,TPd4 > |

3 Definitions

3.1 Terms defined elsewhere

This Supplement uses the following terms defined elsewhere:

3.1.1 NGN transport stratum [ITU-T Y.2011]: That part of the NGN which provides the user functions that transfer data and the functions that control and manage transport resources to carry such data between terminating entities.

3.2 Terms defined in this supplement

This supplement defines the following terms:

3.2.1 user data: All information that specifies identification, authentication, subscribed services, service provisions, access configuration, location management, routing and charging for the NGN user. Some user data are managed as permanent, i.e., they can only be changed by administration means, and other data are temporary which may change as a result of normal operation of the system.

3.2.2 transport user data: User data that is stored, handled and maintained by the functional entities in the transport stratum.

4 Abbreviations and acronyms

This supplement uses the following abbreviations and acronyms:

CPE	Customer Premises Equipment
HGW	Home Gateway
HGWC-FE	Home Gateway Configuration Functional Entity
ID	Identifier
IMS	IP Multimedia Subsystem
NACF	Network Attachment Control Function
P-CSCF	Proxy-Call Session Control Function
RACF	Resource and Admission Control Function
SCF	Service Control Function
SUP-FE	Service User Profile Functional Entity
TAA-FE	Transport Authentication and Authorization Functional Entity
TLM-FE	Transport Location Management Functional Entity
TUP-FE	Transport User Profile Functional Entity
VCI	Virtual Channel Identifier
VPI	Virtual Path Identifier
xDSL	x Digital Subscriber Line

5 Conventions

There is no particular notation, style, presentation or other conventions used within this supplement.

6 Generic requirements on NGN transport user data

The transport stratum needs to authenticate and authorize the user to access the network as the network resource is only available for authenticated users. Also, transport stratum should be able to provide related user data to other control functions. Service stratum may need to know the user's location and access network type, and RACF will require transport resource subscription information from it.

7 User data for authentication and authorization of network access

7.1 Data related to access authentication

When a user accesses the network, the network needs to authenticate the user, and then to decide whether to authorize the user to use the network. The data related to access authentication includes the user identity, supported authentication methods and authentication keys.

In case of xDSL, for example, the web-based authentication method may be provided. A user is redirected to a web authentication page, and a user name and password are required. The access network will authenticate the user according to the information provided by the user.

7.2 Data related to access authorization

When a user is authenticated to access the network, the network should authorize the user to use the network resources according to the subscription and the current status of the network. The data includes the transport resource subscription information.

8 User data for access network configuration

8.1 Data related to transport user profile identification

8.1.1 Transport subscriber identifier

The transport subscriber identifier is a globally unique identifier of the CPE requesting IP connectivity. This identifier is used for locating the transport subscription information for the CPE. The transport subscriber identifier is also used as the user identity for transport stratum authentication.

8.1.2 Default transport subscriber identifier

The default transport subscriber identifier is used to query the TAA-FE in case no transport subscriber identifier is received from the TAA-FE. The default transport subscriber identifier is derived from the physical connection identifier.

8.1.3 Sub-profile identifier

This transport user profile may be sub-divided into sub-profiles. The sub-profile identifier identifies sub-profiles, each of which is associated to one or more logical connection identifiers.

8.2 Data related to access identification

8.2.1 Unique IP address

The unique IP address is the IP address of the attached CPE allocated by NACF.

8.2.2 Address realm

The address realm is the addressing domain in which the assigned IP address is significant. The address realm is managed by the NACF.

In case IPv4 is used, unique IP address combined with address realm uniquely identifies address information of the user equipment globally. In case IPv6 is used, unique IP address is enough to identify the globally unique address information of the CPE.

8.2.3 Physical connection identifier

The physical connection identifier is the identity of the physical access to which the CPE is connected. In case of xDSL, the physical connection identifier identifies the copper line.

8.2.4 Logical connection identifier

The logical connection identifier is used to identify a pipe carrying service traffic. It is the identity of the logical access used by the attached CPE. In case of xDSL, the logical connection identifier may explicitly contain the identity of the port, VPI and/or VCI carrying the traffic.

8.2.5 Type of access transport network

The type of access transport network is the type of access network over which IP connectivity is provided to the CPE. It is derived from the logical connection identifier.

8.2.6 CPE type

The CPE type is the type of CPE to which the IP address is allocated.

8.3 Data related to location management

8.3.1 Privacy indicator

The privacy indicator indicates whether location information can be exported to services and applications depending on the subscriber's security level. The privacy indicator is stored in TUP-FE permanently, and in TLM-FE temporarily.

8.3.2 Location information

The location information is derived from the physical connection identifier and is stored temporarily in the TLM-FE.

8.3.3 Geographic location information (optional)

The geographic location information is stored temporarily in the TLM-FE.

8.4 Data related to transport resource subscription

The transport resource subscription data may contain one or more sets of the following information elements.

8.4.1 Transport subscription profile identifier

The transport subscription profile identifier is the identifier of a set of transport profile information.

8.4.2 Transport subscription profile description

The transport subscription profile description is the description of a set of transport subscription profile information. Either the transport subscription profile identifier or the transport subscription profile description may be presented, but not both at the same time.

8.4.3 Network class of service

The network class of service is the network service class subscribed by the attached CPE.

8.4.4 Subscribed upstream bandwidth

The subscribed upstream bandwidth is the maximum amount of the bandwidth subscribed by the attached CPE in the uplink direction.

8.4.5 Subscribed downstream bandwidth

The subscribed downstream bandwidth is the maximum amount of the bandwidth subscribed by the attached CPE in the downlink direction.

8.4.6 Level of priority

The level of priority is the maximum priority allowed for any reservation request.

8.4.7 Requestor name

The requestor name identifies the requestors that are allowed to request resources for the transport resource subscription.

8.5 Data related to default configuration (optional)

8.5.1 Default configuration identifier

The default configuration identifier is the identifier for default configuration.

8.5.2 Default configuration description

The default configuration description is the description of a default configuration. Either the default configuration identifier or the default configuration description may be presented, but not both at the same time.

8.5.3 Default access control List: allowed destinations

The default access control list: allowed destinations is the list of destination IP addresses, ports, prefixes and port ranges allowed to cut through by default.

8.5.4 Default access control list: denied destinations

The default access control list: denied destinations is the list of destination IP addresses, ports, prefixes and port ranges denied to cut through by default.

8.5.5 Default upstream bandwidth

The default upstream bandwidth is the maximum bandwidth that can be used for the upstream connections by default.

8.5.6 Default downstream bandwidth

The default downstream bandwidth is the maximum bandwidth that can be used for the downstream connections by default.

8.6 Data related to access authentication

8.6.1 Authentication scheme type

The authentication scheme type indicates which type of authentication scheme can be used for the user.

8.6.2 Authentication context data

The authentication context data is the context data which the relevant authentication scheme needs.

8.6.3 Security association

The security association is the session key created by TAA-FE during the network access authentication procedure and used for management authentication also. It is used for HGWC-FE and HGW to establish a secure connection between them.

8.7 Data related to identification of other functional entities

8.7.1 RACF point of contact

The RACF point of contact is the address of the RACF element where the subscriber profile should be pushed. It is derived from logical connection identifier.

8.7.2 P-CSCF identity (optional)

The P-CSCF identity is used for accessing IMS services in service stratum.

8.7.3 HGWC-FE address (optional)

The HGWC-FE address is the address of the HGWC-FE entity from which configuration data may be retrieved by the CPE.

8.7.4 SCF identity

The SCF identity is the identity of the requesting service control function.

8.8 Data related to mobility

8.8.1 List of authorized visited network identifiers (optional)

This list is associated with the transport subscriber identifier and indicates which visited network identifiers are allowed for roaming. The TAA-FE proxy will retrieve this information via the TAA-FE server from the home TUP-FE when the user is accessed from the visited NACF.

8.8.2 Attached access domain name

The attached access domain name is the access domain name or the provider's name of the network.

8.8.3 Index of local NACF

The index of local NACF is the address of the local NACF the user belongs to which is registered by the TLM-FE. The home TLM-FE will use index of local NACF to locate the local NACF to which the CPE is attached when the CPE moves.

8.9 Data related to event management

8.9.1 Event

The event defines the type of event to be monitored by TLM-FE, i.e., user logon, location information change, CPE type change. The TLM-FE will notify the FE who subscribes to the event when the event occurs.

9 Summary of data stored in transport functional entities

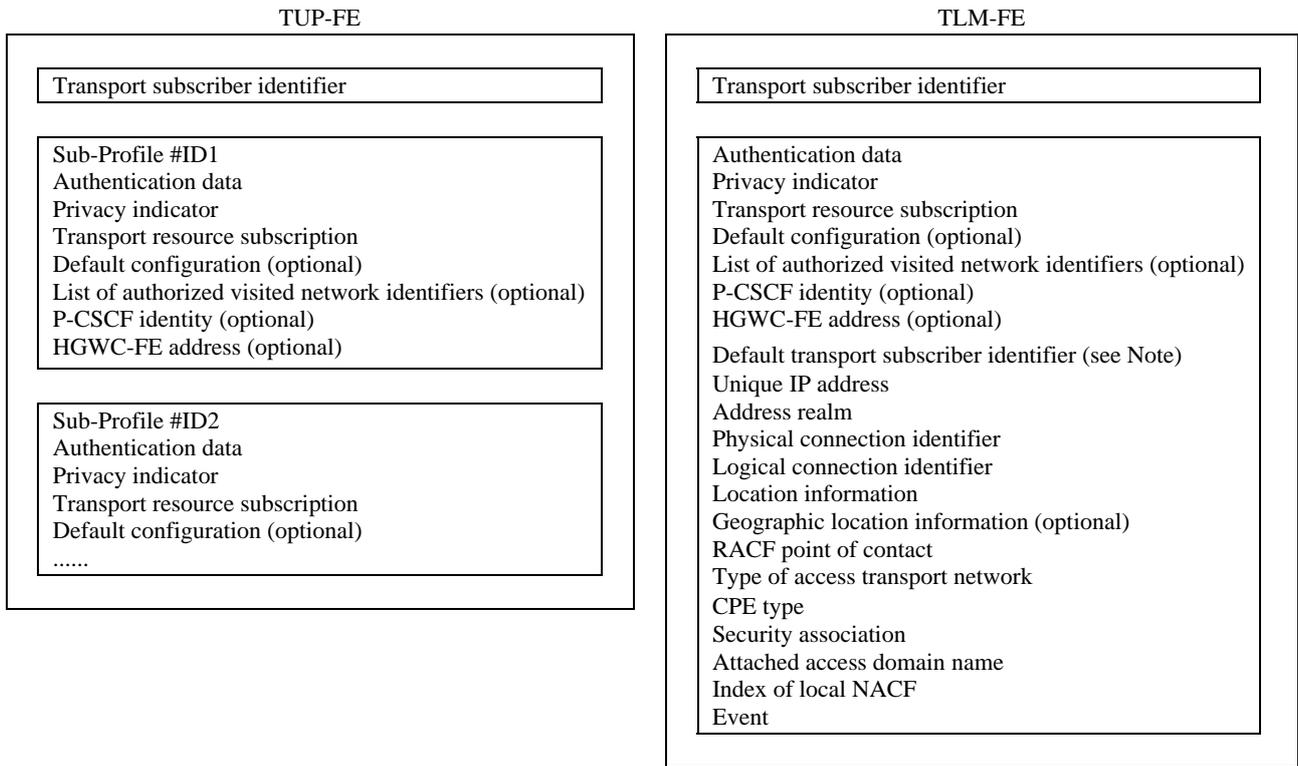
This clause summarizes the location of user data with the information identifying whether the data is temporary (T) or permanent (P).

Table 9-1 – Location and longevity of the parameters

Parameter	TLM-FE	TUP-FE
Transport subscriber identifier	T	P
Sub-profile identifier		P
Default transport subscriber identifier	T	
Unique IP address	T	
Address realm	T	
Physical connection identifier	T	
Logical connection identifier	T	
Type of access transport network	T	
CPE type	T	
Privacy indicator	T	P
Location information	T	
Geographic location information (optional)	T	
Transport subscription profile identifier	T	P
Transport subscription profile description	T	P
Network class of service	T	P
Subscribed upstream bandwidth	T	P
Subscribed downstream bandwidth	T	P

Table 9-1 – Location and longevity of the parameters

Parameter	TLM-FE	TUP-FE
Level of priority	T	P
Requestor name	T	P
Default configuration identifier (optional)	T	P
Default configuration description (optional)	T	P
Default access control list: allowed destinations (optional)	T	P
Default access control list: denied destinations (optional)	T	P
Default upstream bandwidth (optional)	T	P
Default downstream bandwidth (optional)	T	P
Authentication scheme type		P
Authentication context data		P
Security association	T	
RACF point of contact	T	
P-CSCF identity (optional)		P
SCF identity	T	
HGWC-FE address (optional)		P
List of authorized visited network identifiers (optional)		P
Attached access domain name	T	
Index of local NACF	T	
Event	T	

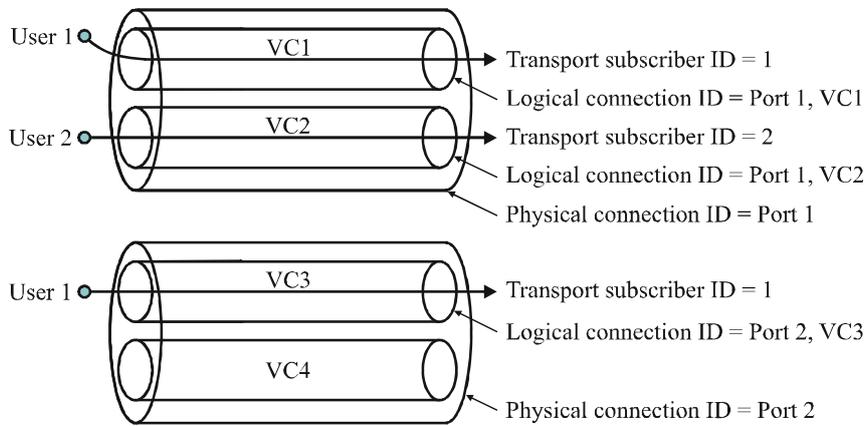


NOTE – Default transport subscriber identifier is only used when the TLM-FE cannot get the transport subscriber identifier from TAA-FE.

Figure 9-1 – Transport user data stored in TLM-FE and TUP-FE

Appendix I

Illustration of the relationship of IDs in transport user data



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Figure I.1 – Relationships of IDs in transport user data

A user can use the same terminal moving to different access points and access networks, or utilize different terminals to access the network at different access points to retrieve their NGN services. No matter which access network he is attached to, the user always uses a unique transport subscriber identifier to identify himself to the transport network. The access line where the user's CPE is attached is identified by a physical connection identifier and a logical connection identifier. When the user moves, he will access from different access lines with a different physical connection identifier and logical connection identifier, which is allocated by the local operator.

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