International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Y.2341

(03/2017)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

Next Generation Networks – Enhancements to NGN

Next generation network evolution – Requirements and capabilities for supporting authorized account messaging service

Recommendation ITU-T Y.2341

International Telecommunication Union

ITU-T Y-SERIES RECOMMENDATIONS

GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

GLOBAL INFORMATION INFRASTRUCTURE	
General	Y.100–Y.199
Services, applications and middleware	Y.200–Y.299
Network aspects	Y.300–Y.399
Interfaces and protocols	Y.400–Y.499
Numbering, addressing and naming	Y.500–Y.599
Operation, administration and maintenance	Y.600–Y.699
Security	Y.700–Y.799
Performances	Y.800–Y.899
INTERNET PROTOCOL ASPECTS	
General	Y.1000–Y.1099
Services and applications	Y.1100–Y.1199
Architecture, access, network capabilities and resource management	Y.1200–Y.1299
Transport	Y.1300–Y.1399
Interworking	Y.1400–Y.1499
Quality of service and network performance	Y.1500–Y.1599
Signalling	Y.1600–Y.1699
Operation, administration and maintenance	Y.1700–Y.1799
Charging	Y.1800–Y.1899
IPTV over NGN	Y.1900–Y.1999
NEXT GENERATION NETWORKS	
Frameworks and functional architecture models	Y.2000–Y.2099
Quality of Service and performance	Y.2100–Y.2199
Service aspects: Service capabilities and service architecture	Y.2200–Y.2249
Service aspects: Interoperability of services and networks in NGN	Y.2250–Y.2299
Enhancements to NGN	**Y.2300–Y.2399**
Network management	Y.2400–Y.2499
Network control architectures and protocols	Y.2500–Y.2599
Packet-based Networks	Y.2600–Y.2699
Security	Y.2700–Y.2799
Generalized mobility	Y.2800–Y.2899
Carrier grade open environment	Y.2900–Y.2999
FUTURE NETWORKS	Y.3000–Y.3499
CLOUD COMPUTING	Y.3500–Y.3999
INTERNET OF THINGS AND SMART CITIES AND COMMUNITIES	
General	Y.4000–Y.4049
Definitions and terminologies	Y.4050–Y.4099
Requirements and use cases	Y.4100–Y.4249
Infrastructure, connectivity and networks	Y.4250–Y.4399
Frameworks, architectures and protocols	Y.4400–Y.4549
Services, applications, computation and data processing	Y.4550–Y.4699
Management, control and performance	Y.4700–Y.4799
Identification and security	Y.4800–Y.4899
Evaluation and assessment	Y.4900–Y.4999

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T Y.2341

Next generation network evolution – Requirements and capabilities for supporting authorized account messaging service

Summary

Recommendation ITU-T Y.2341 specifies requirements of profile management, identification, messaging related features, open API, resource allocation and policy control, as well as capabilities support of service stratum, transport stratum and end user in next generation network (NGN) evolution for supporting authorized account messaging service.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T Y.2341	2017-03-29	13	11.1002/1000/13250

Keywords

Authorized account messaging service, IP multimedia subsystem, IMS, next generation network, NGN.

* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

Table of Contents

Recommendation ITU-T Y.2341

Next generation network evolution – Requirements and capabilities for supporting authorized account messaging service

1 Scope

This Recommendation specifies requirements and capabilities of next generation network (NGN) evolution for supporting authorized account messaging service, in order to enable a NGN end user to subscribe a profile of the entity (third-party provider) for accessing the information via messaging exchange.

This Recommendation introduces a basic scheme and business roles for authorized account messaging service support in NGN evolution, and it also specifies the requirements and the capabilities of authorized account messaging service in NGN evolution.

Relevant scenarios for authorized account messaging service are provided in Appendix I.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.2012] Recommendation ITU-T Y.2012 (2010), *Functional requirements and architecture of next generation networks.*

[ITU-T Y.2021] Recommendation ITU-T Y.2021 (2006), *IMS for Next Generation Networks.*

[ITU-T Y.2111] Recommendation ITU-T Y.2111 (2011), *Resource and admission control functions in next generation networks.*

[ITU-T Y.2201] Recommendation ITU-T Y.2201 (2006), *Functional requirements and architecture of the NGN release 1.*

[ITU-T Y.2234] Recommendation ITU-T Y.2234 (2008), *Open service environment capabilities for NGN.*

[ITU-T Y.2240] Recommendation ITU-T Y.2240 (2011), *Requirements and capabilities for next generation network service integration and delivery environment.*

[ITU-T Y.2701] Recommendation ITU-T Y.2701 (2007), *Security requirements for NGN release 1.*

[ITU-T Y.2702] Recommendation ITU-T Y.2702 (2008), *Authentication and authorization requirements for NGN release 1.*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 application [b-ITU-T Y.2013]: A software entity residing on an application server that contributes to the delivery of an end user service.

3.1.2 application network interface (ANI) [ITU-T Y.2012]: Interface which provides a channel for interactions and exchanges between applications and NGN elements. The ANI offers capabilities and resources needed for the realization of applications.

3.1.3 application programming interface (API) [b-ITU-T I.312]: An API provides a set of interfaces from an application environment to an execution environment. The execution environment provides services to the application environment.

3.1.4 next generation network (NGN) [b-ITU-T Y.2001]: A packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

3.1.5 NGN service stratum [b-ITU-T Y.2011]: That part of the NGN which provides the user functions that transfer service-related data and the functions that control and manage service resources and network services to enable user services and applications.

3.1.6 NGN transport stratum [b-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.

3.1.7 open service environment capabilities [ITU-T Y.2234]: Capabilities provided by an open service environment to enable enhanced and flexible service creation and provisioning based on the use of standards interfaces.

3.1.8 service [b-ITU-T Y.2091]: A set of functions and facilities offered to a user by a provider.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 authorized account: A profile of the entity which a NGN end user can subscribe for accessing the information via messaging exchange.

NOTE 1 – "authorized" means the account is sanctioned and recognized by the service provider (third-party provider) and it is always available to be accessed.

NOTE 2 – The profile is a numeric string which includes the identity of the entity and the service information of the entity.

3.2.2 authorized account messaging service: A messaging service through which third-party provider can register to an authorized account and interact with the account subscribers via messaging exchange.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AAMS Authorized Account Messaging Service

ANI Application Network Interface

API Application Programming Interface

IMS IP Multimedia Subsystem

NGN Next Generation Network

OSE Open Service Environment

QoS Quality of Service

RACF Resource and Admission Control Function

SUP Service User Profile

UE User Equipment

UNI User Network Interface

UTF Unicode Transformation Format

5 Conventions

In this Recommendation:

The keywords "is required to" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this Recommendation is to be claimed.

The keywords "is prohibited from" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this Recommendation is to be claimed.

The keywords "is recommended" indicate a requirement which is recommended but which is not absolutely required. Thus this requirement need not be present to claim conformance.

The keywords "is not recommended" indicate a requirement which is not recommended but which is not specifically prohibited. Thus, conformance with this specification can still be claimed even if this requirement is present.

The keywords "can optionally" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with the specification.

6 Introduction of NGN evolution for supporting authorized account messaging service

Authorized account messaging service is a messaging service through which the authorized account owner of the service (third-party provider) can register to an authorized account and interact with the authorized account subscribers (NGN end user) via messaging exchange (provided by the NGN provider). The content of these messages can vary, including text, image, video, audio, location information and other types of information.

Figure 1 provides the basic scheme for authorized account messaging service, which shows the related business roles and interactions among them.

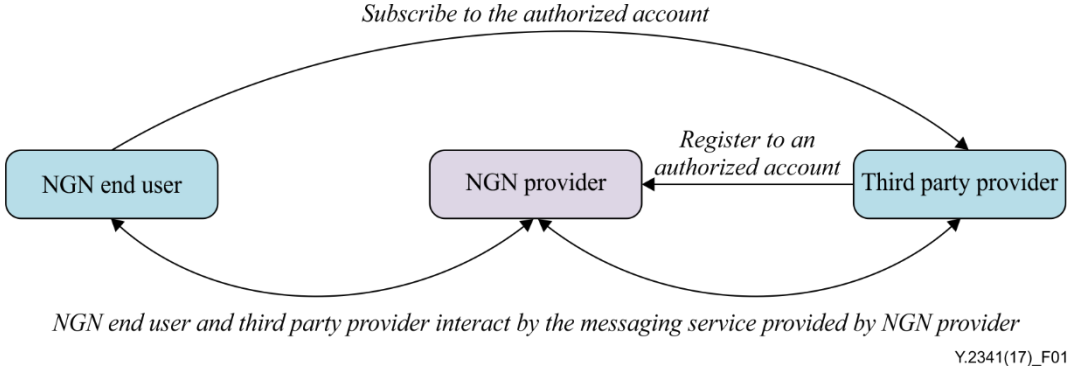

Figure 1 – Basic scheme for authorized account messaging service

In the basic scheme for authorized account messaging service, three business roles are identified:

– NGN provider: the NGN provider provides the messaging service, which realizes the connection between third-party provider (authorized account owner) and NGN end user (authorized account subscriber). The NGN provider can provide a convenient solution for message exchange;

– Third-party provider: the third-party provider is the entity that wants to publish information or provide interactive applications to subscribers via the messaging service. An authorized account can be applied to the NGN provider by individuals or enterprises, but always needs to be registered by the NGN provider before the applicant is recognized as third-party provider. In addition, the authorized account needs to be a formal and stable source of information from the perspective of the NGN provider;

– NGN end user: the NGN end user is the entity which is interested in the information or applications provided by the third-party provider, and subscribes to the authorized account in order to access the information or applications.

7 Requirements of NGN evolution for authorized account messaging service support

The specific requirements for authorized account messaging service support identified in this clause are new or extended requirements to those already supported by existing NGN specifications. The requirements which are already supported by existing NGN specifications are outside the scope of this Recommendation.

7.1 Requirements of profile management

NGN is required to support management of the third-party provider's authorized account profiles.

NOTE – These profiles may include the following items: a third-party provider's authorized account, nickname, real name, description, type (identifying if the third-party provider is a person or an enterprise), message type (of the messages sent by the third-party provider); the availability of a menu for the authorized account, the authorized account status (indicating whether the authorized account status is active or suspended or has been cancelled), other information of the third-party provider such as telephone number, email, zip code, address, field, logo, two-dimension code, etc.

7.2 Requirements of identification

NGN is required to support identification of the authorized accounts.

NGN is required to support identification of the traffic related to the authorized account messaging service.

7.3 Requirements of messaging related features

NGN is required to support authorized account messaging related features with consideration of the following aspects:

– exchange of the authorized account messages;

NOTE 1 – An authorized account message can include text, image, audio, video, location, v-card and structured information. The structured information can include, for example, multiple media formats suitable for sending articles, news and other advertisement information.

– NGN end-user's searching, subscribing or unsubscribing an authorized account;

– negotiation of the message encoding mode (e.g., UTF-8, Base64) between NGN provider and NGN end-user;

– policy and traffic control in the service level when delivering authorized account messages.

NOTE 2 – Policy and traffic control can allow, for example, setting different messaging transmission rates and delivery time requirements concerning NGN delivery of authorized account messages to authorized account subscribers.

7.4 Requirements of open API

NGN is required to provide single sign-on open API to third-party providers.

NOTE – A third-party provider calls the single sign-on open API to enable its subscribers login its webpage implicitly when accessing the authorized account messaging service.

7.5 Requirements of resource allocation and policy control

NGN is required to support resource allocation and policy control for large scale messaging. This includes, as an example, the setting of different messaging transmission rates and delivery time requirements concerning NGN delivery of authorized account messages to authorized account subscribers.

NOTE – The number of subscribers of an authorized account may be very large. This is especially the case when there may be many authorized accounts and each authorized account has many subscribers, and a large number of messages may be sent at the same time.

8 Capabilities of NGN evolution for authorized account messaging service support

8.1 Capability framework overview

The capabilities of NGN evolution for authorized account messaging service support are based on the NGN capabilities described in [ITU-T Y.2201]. Only new or extended capabilities for authorized account messaging service support are identified in this capability framework.

Figure 2 shows an overview of the capability framework for authorized account messaging service support in the context of the NGN reference architecture [ITU-T Y.2012].

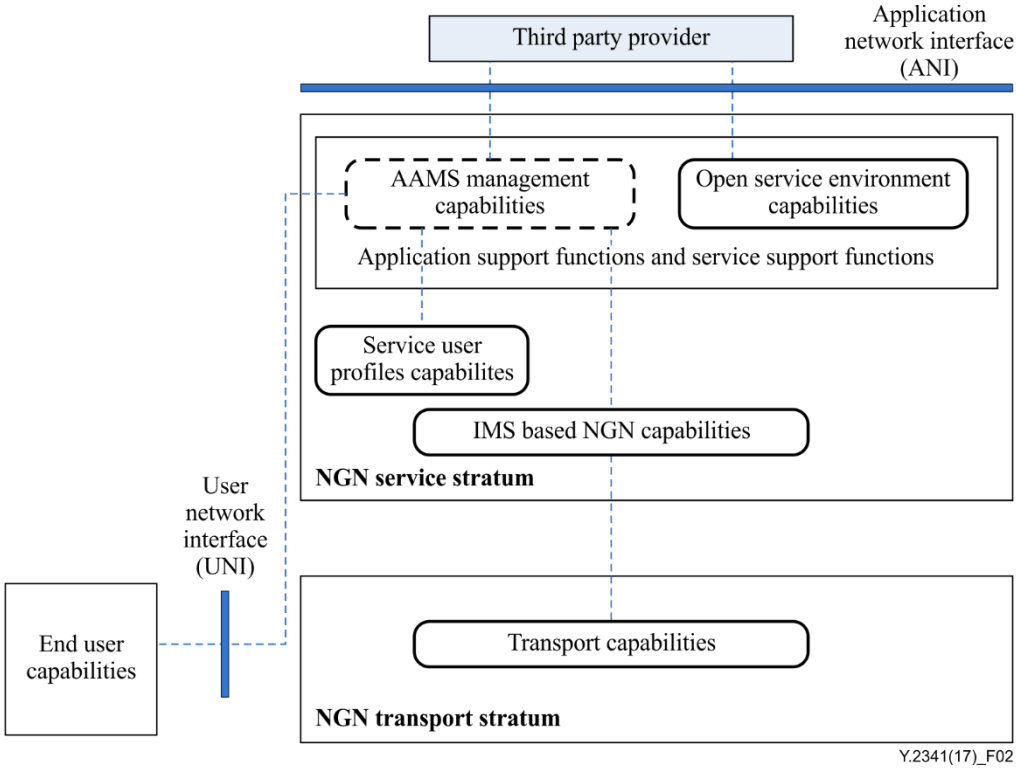

Figure 2 – Overview of the capability framework for authorized account messaging service support in the context of the NGN reference architecture

The capabilities of NGN evolution for supporting authorized account messaging service satisfy the requirements identified in clause 7 as follows:

– the authorized account messaging service management capabilities (AAMS management capabilities) and end user capabilities support the requirements of messaging related features (seen in clause 7.3);
– service user profile (SUP) capabilities support the requirements of profile management (seen in clause 7.1);
– open service environment (OSE) capabilities support the requirements of open API (seen in clause 7.4);
– IP multimedia subsystem (IMS) based NGN capabilities support the requirements of identification (seen in clause 7.2);
– transport capabilities support the requirements of resource allocation and policy control (seen in clause 7.5).

Clauses 8.2 to 8.4 provide details on the capabilities of NGN evolution for support of authorized account messaging service.

8.2 Service stratum

8.2.1 Service user profile capabilities

Service user profile capabilities are responsible for managing third-party providers' profiles.

SUP capabilities of NGN evolution for authorized account messaging service support are aligned with the functional requirements of SUP in NGN [ITU-T Y.2012] with the following additional requirements:

– support of creation and maintenance of the third-party providers' profiles;
– support of providing third-party providers' profiles to the AAMS management capabilities.

8.2.2 IMS based NGN capabilities

IMS-based NGN capabilities for the authorized account messaging service support are aligned with the requirements of IMS for next generation networks [ITU-T Y.2021], with the following additional requirements:

– support of identification of the authorized accounts;
– support of identification of the traffic related to the authorized account messaging service;
– support of providing message routing between the AAMS management capabilities and end user capabilities.

8.2.3 AAMS management capabilities

AAMS management capabilities, located in application support functions and service support functions, are responsible for dealing with the authorized account messaging service related functions.

AAMS management capabilities for the authorized account messaging service are aligned with the requirements of application support and service support in NGN [ITU-T Y.2012], with the following additional requirements:

– support of providing authorized account message exchange function between third-party providers and NGN end-user;
– support of NGN end-user's authorized account searching, subscribing or unsubscribing;
– support of negotiating message encoding mode with NGN end-user;

– support of policy and traffic control in the service level when delivering authorized account messages.

8.2.4 Open service environment capabilities

Open service environment (OSE) capabilities are responsible for providing open APIs to third-party providers.

Open service environment capabilities of NGN evolution for authorized account messaging service support are aligned with the requirements of openness identified in NGN [ITU-T Y.2234] [ITU-T Y.2240] with the additional support of single sign-on open API to third-party providers.

NOTE – An authorized account calls the single sign-on open API to obtain the subscriber's identity information when one of its subscribers requires logging on the authorized account's webpage.

8.3 Transport stratum

Transport capabilities support the provision of a channel for the exchange of authorized account messages via the interaction with the IMS-based NGN capabilities.

Transport capabilities for the authorized account messaging service support the functional requirements of resource and admission control functions (RACF) [ITU-T Y.2111], with the additional support of transport resource allocation and management of quality of service (QoS) policies with respect to:

– intelligent assignment and adjustment of bandwidth and QoS level for the exchange of authorized account messages according to requirements from both NGN provider and third-party provider.

8.4 End user

End user capabilities for the authorized account messaging service are aligned with the end user functions requirements in [ITU-T Y.2012], with the following additional requirements:

– support of exchanging authorized account messages with AAMS management capabilities through the user network interface (UNI);

– support of negotiating message encoding mode with AAMS management capabilities;

– support of NGN end user's authorized account searching, subscribing or unsubscribing through the user network interface.

9 Security considerations of NGN evolution for supporting authorized account messaging service

The requirements of NGN evolution for authorized account messaging service support are aligned with the NGN security requirements according to [ITU-T Y.2201], [ITU-T Y.2701] and [ITU-T Y.2702].

Appendix I

Scenarios of authorized account messaging service

(This appendix does not form an integral part of this Recommendation.)

I.1 Subscribe and notify scenario

Figure I.1 shows the message interaction between the capabilities in the various subscribe and notify scenarios.

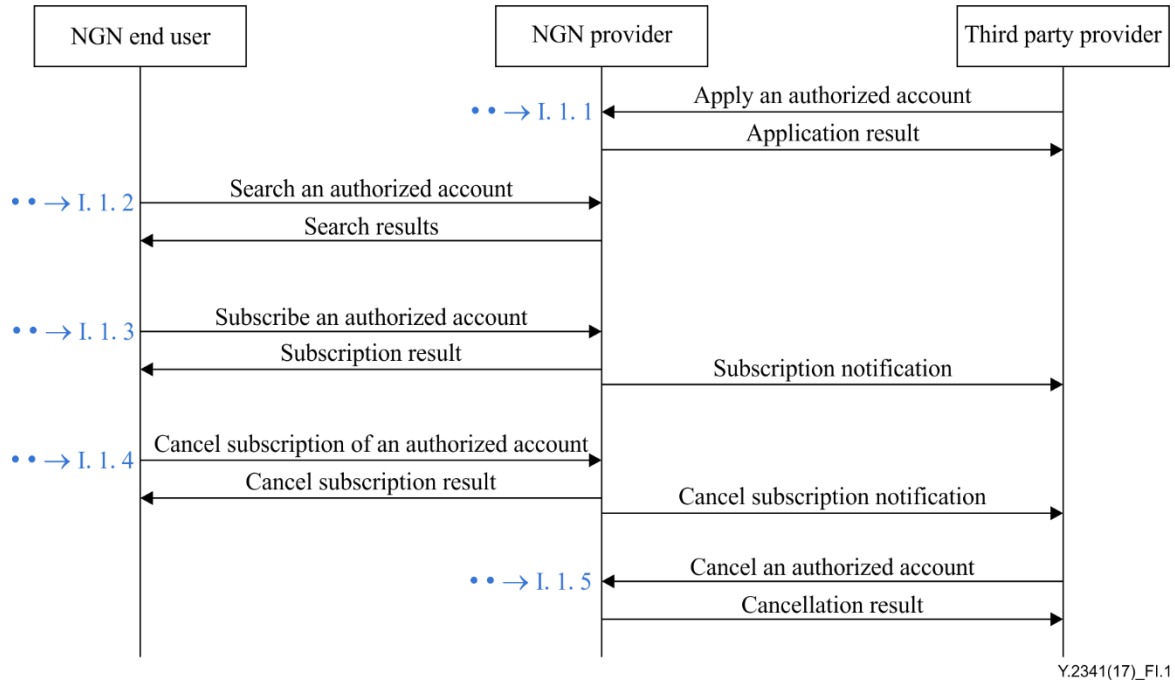

Figure I.1 – The subscribe and notify scenario of the authorized account messaging service

I.1.1 Apply an authorized account

A third-party provider applies an authorized account from the NGN provider. Then he/she is permitted to send messages to the NGN end users who have subscribed to this authorized account.

I.1.2 Search an authorized account

A NGN end user searches an authorized account on his/her user equipment (UE) according to the key words of the authorized account ID.

The user clicks an item in the searching list to access the detailed information of this authorized account.

I.1.3 Subscribe an authorized account

A NGN end user subscribes an authorized account by clicking the subscription button in the authorized account's detailed information at the user interface. After successful subscription, the NGN end user can interact with this authorized account.

A NGN end user can also scan an authorized account's two-dimension code to subscribe the authorized account.

I.1.4 Cancel subscription of an authorized account

A NGN end user cancels subscription of an authorized account. Then he/she will not receive the authorized account's message any more.

I.1.5 Cancel an authorized account

A third-party provider applies to cancel his/her authorized account. The final service charging is settled before the authorized account is cancelled.

I.2 Interactive application scenario

Figure I.2 shows the message interaction between the various capabilities in the interactive application scenario.

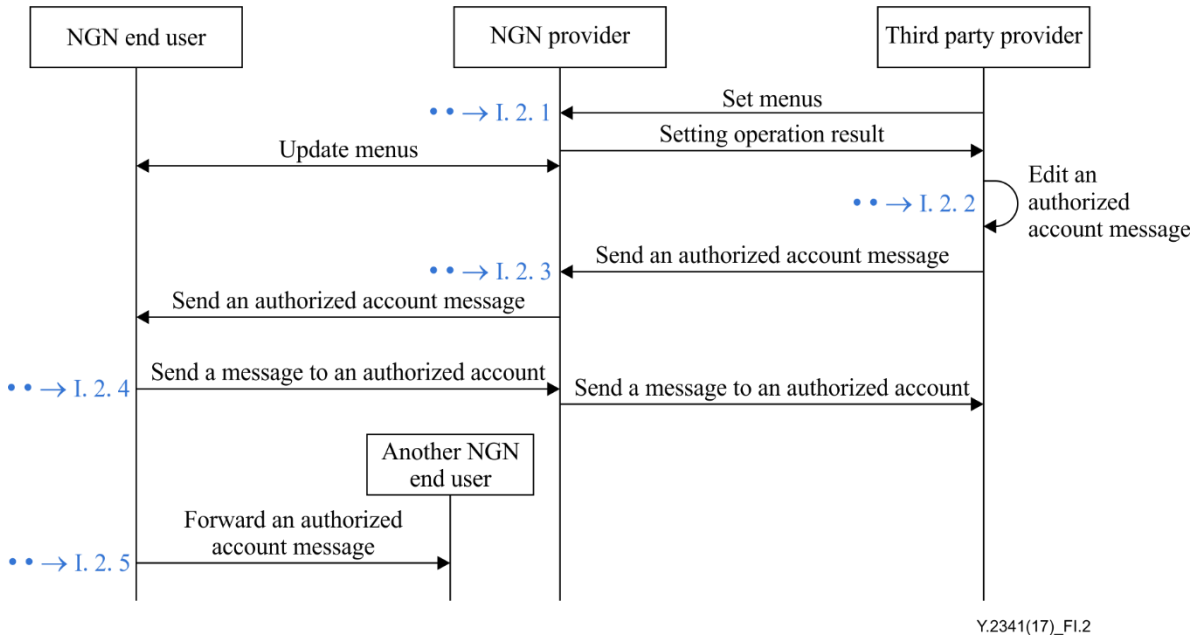

Figure I.2 – The interactive application scenario of the authorized account messaging service

I.2.1 Authorized account menu setting

A third-party provider sets some menu items. The menu is displayed on the chat interface of its subscribers' UE. A NGN end user interacts with the authorized account through clicking the menu items.

The menu may have two levels. For example, the primary menu has three items and each of the primary menu items has five sub-menu items. Each sub-menu item executes the following three actions:

– sending a message: A third-party provider sets the menu item's corresponding content as the content of a message sent to the authorized account. When a NGN end user clicks the menu item, a message or short message with this content will be sent to the authorized account;

– accessing a web page: A third-party provider sets the menu item's corresponding content as access web address. When an authorized account subscriber clicks the menu item, the web page corresponding to that web address will be opened in the authorized account application;

– invoking a UE's local API: A third-party provider sets the menu item's corresponding action as invoking a UE's local API. When an authorized account subscriber clicks the menu item, a UE's local API will be invoked.

I.2.2 Authorized account message editing

A third-party provider edits messages which can include text, image, audio, video, location, emoticon and structured information.

The structured information can include several multimedia items. For example, each item could include the title, main text, link address of multimedia's thumbnail and link address of the whole message body.

I.2.3 Authorized account message sending

A third-party provider sends the message that he/she has edited to his subscribers. All subscribers or a particular subscriber group can be selected as the receivers.

A third-party provider can set a welcome message sent to the new subscribers automatically. The welcome message can include text, image, video, audio, and structured information.

A third-party provider can set a reply message sent in reply to his/her subscribers' messages automatically.

I.2.4 End user message sending

A NGN end user sends a message to an authorized account which he/she has subscribed. The message could be text, image, video, audio, location, emoticon, etc.

If a NGN end user sends a message to an authorized account that has cancelled the authorized account service, he/she will receive a notification message.

A NGN end user can check the exchanged messages of an authorized account.

I.2.5 End user message forwarding

A NGN end user can forward the free messages received from the authorized account to other NGN end users. Charged messages cannot be forwarded.

Bibliography

[b-ITU-T I.312] Recommendation ITU-T I.312/Q.1201 (1992), *Principles of intelligent network architecture*.

[b-ITU-T Y.2001] Recommendation ITU-T Y.2001 (2004), *General overview of NGN*.

[b-ITU-T Y.2011] Recommendation ITU-T Y.2011 (2004), *General principles and general reference model for Next Generation Networks*.

[b-ITU-T Y.2013] Recommendation ITU-T Y.2013 (2006), *Converged services framework functional requirements and architecture*.

[b-ITU-T Y.2091] Recommendation ITU-T Y.2091 (2011), *Terms and definitions for next generation networks*.

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	Tariff and accounting principles and international telecommunication/ICT economic and policy issues
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling, and associated measurements and tests
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	**Global information infrastructure, Internet protocol aspects, next-generation networks, Internet of Things and smart cities**
Series Z	Languages and general software aspects for telecommunication systems

Printed in Switzerland
Geneva, 2017