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SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS

Next Generation Networks – Service aspects: Service capabilities and service architecture

NGN capability requirements to support the multimedia communication centre service

Recommendation ITU-T Y.2216

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Recommendation ITU-T Y.2216

NGN capability requirements to support the multimedia communication centre service

Summary

The objective of Recommendation ITU-T Y.2216 is to identify and describe the service requirements of the multimedia communication centre (MCC) service and related extended or new NGN capability requirements.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T Y.2216	2010-03-16	13

Keywords

Capability requirements, MCC service, NGN.

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.

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1 Scope

The objective of this Recommendation is to identify and describe the service requirements of the multimedia communication centre (MCC) service and related extended or new NGN capability requirements.

The scope of this Recommendation includes:

– description of the MCC service;

– service requirements of the MCC service;

– NGN capability requirements to support the MCC service.

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 G.711] Recommendation ITU-T G.711 (1988), *Pulse code modulation (PCM) of voice frequencies.*

[ITU-T G.722.2] Recommendation ITU-T G.722.2 (2003), *Wideband coding of speech at around 16 kbit/s using Adaptive Multi-Rate Wideband (AMR-WB)*.

[ITU-T G.723.1] Recommendation ITU-T G.723.1 (2006), *Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s*.

[ITU-T G.729 – Annex A] Recommendation ITU-T G.729 – Annex A (2006), *Reduced complexity 8 kbit/s CS-ACELP speech codec*.

[ITU-T H.263] Recommendation ITU-T H.263 (2005), *Video coding for low bit rate communication.*

[ITU-T H.264] Recommendation ITU-T H.264 (2005), *Advanced video coding for generic audiovisual services.*

[ITU-T M.3050.1] Recommendation ITU-T M.3050.1 (2007), *Enhanced Telecom Operations Map (eTOM) – The business process framework*.

[ITU-T Y.2012] Recommendation ITU-T Y.2012 (2006), *Functional requirements and architecture of the NGN release 1*.

[ITU-T Y.2201] Recommendation ITU-T Y.2201 (2009), *Requirements and capabilities for ITU-T NGN*.

[ITU-T Y.2233] Recommendation ITU-T Y.2233 (2008), *Requirements and framework allowing accounting and charging capabilities in NGN*.

[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*.

[ATIS.3GPP.26.071V600-2006] 3GPP TS 26.071 V6.0.0 (2004), *Mandatory speech CODEC speech processing functions; AMR speech CODEC; General description*.

[GB/T20090.2] GB/T20090.2-2006 (2006), *Information Technology – Advanced Coding of Audio and Video Part 2: Video*.

[ISO/IEC 14496-2] ISO/IEC 14496-2:2004, *Information Technology – Coding of audio-visual objects – Part 2: Visual*.

[TIA-127-C] TIA-127-C (2007), *Enhanced Variable Rate Codec, Speech Service Options 3, 68, and 70 for Wideband Spread Spectrum Digital Systems*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

3.1.1 customer [ITU-T M.3050.1]: The customer buys products and services from the enterprise or receives free offers or services. A customer may be a person or a business.

NOTE – In MCC service, the customers can experience advanced customer services offered by enterprises communicating through the NGN.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 enterprise: The enterprise is responsible for delivering products and services to the customer.

NOTE – In MCC service, by using the multimedia communication centre capabilities provided by NGN, each enterprise can provide its own advanced customer services, like business consultation, sales promotion, etc.

3.2.2 MCC agent: An MCC agent is a NGN end-user who acts as an enterprise's agent in the MCC service. The MCC agent uses an NGN terminal to communicate with customers and perform communication control operations, such as holding or transferring communications, etc.

3.2.3 MCC applications: MCC applications are a set of applications provided and deployed by an enterprise in order to support its MCC service offer to its customers.

NOTE – The MCC applications organize and manage the mechanisms set and controlled by each enterprise in the MCC service. For example, the mechanisms can allow policy control of communication requests queuing, and management of media resources, etc. MCC applications interact with NGN entities to provide MCC service to customers.

3.2.4 MCC service: A service that enables customers to have multimedia communications through the NGN with enterprises by multiple means and that provides advanced features for the customer-enterprise interaction.

NOTE – The multiple means can be multimedia conversational communications, web and application collaboration, content pushing and sharing, etc. Advanced features include enhanced communication control, communication queuing, etc.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

AMR Adaptive Multi-Rate

AMR-WB Adaptive Multi-Rate Wideband

ANI Application Network Interface

ASR Automatic Speech Recognition

AVS Audio Video coding Standard

DTMF Dual Tone Multi-Frequency

EVRC Enhanced Variable Rate Codec

IM Instant Message

IVR Interactive Voice Response

IVVR Interactive Voice and Video Response

MCC Multimedia Communication Centre

MPEG-4 Moving Picture Experts Group 4

NAPT Network Address Port Translation

NAT Network Address Translation

NGN Next Generation Network

NNI Network-Network Interface

QoS Quality of Service

TTS Text to Speech

UNI User to Network Interface

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 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 "can optionally" indicate an optional requirement which is permissible, without implying any sense of being recommended. These terms are 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 Recommendation.

6 Description of the MCC service

The MCC service provides customers with a way to access information services or customer services of an enterprise. Through the MCC service, all communication requests to one enterprise

can be centralized and managed efficiently so that enhanced customer services can be provided. Customers can communicate with the enterprise's MCC agents and/or interactive voice response/interactive voice and video response (IVR/IVVR) system using multiple media. The MCC service also allows enterprises to provide product support or manage information inquiries from customers, as well as to make telemarketing, sales, etc. via outgoing communications.

Figure 1 shows an overview of the MCC service and the relationship between the various roles in the MCC service. These roles include enterprises, MCC agents, MCC applications, the NGN provider, and customers.

In particular, in Figure 1:

– the "partnership relationship" between enterprises and the NGN provider means that enterprises use the multimedia communication centre capabilities offered by the NGN provider;

– the "business relationship" between enterprises and customers means that enterprises provide the customer service through the MCC service, e.g., enterprises do marketing and interact with customers, and customers get product information from the enterprises;

– the "network-end user relationship" between the NGN provider and customers means that customers are the end users of the NGN.

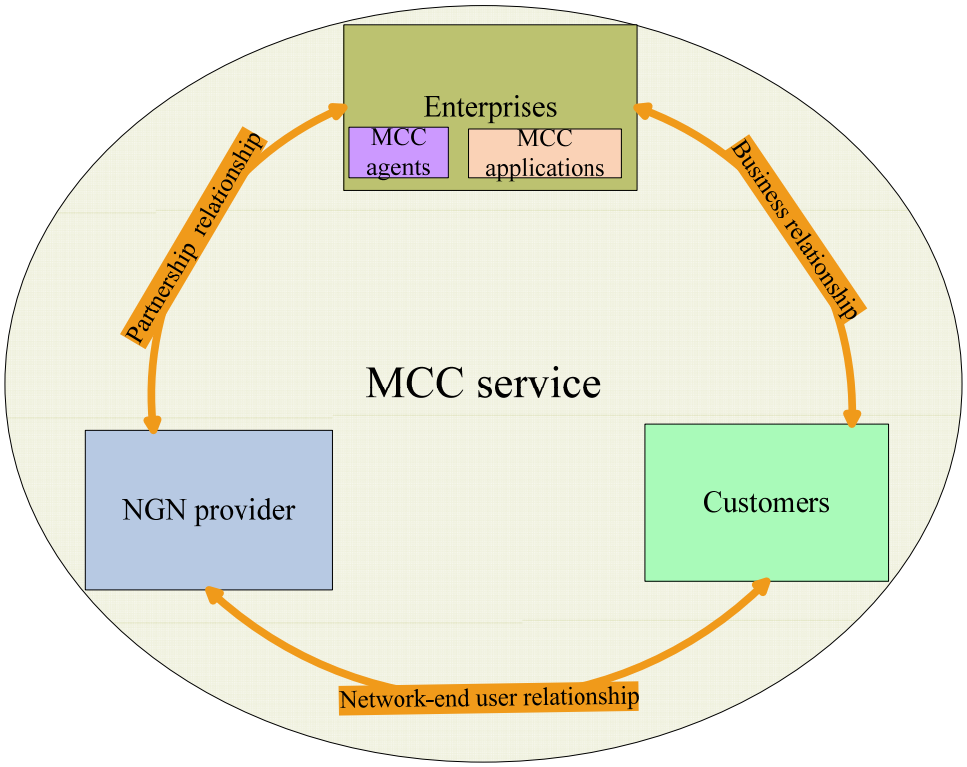

Figure 1 – MCC service overview

In summary, the MCC service is provided to customers through the support of an NGN provider, enterprise MCC agents and enterprise MCC applications.

Some features and examples of MCC service operations are given below:

Each enterprise deploys a number of MCC agents. In case none of the MCC agents is available to answer to a communication request, the MCC service supports the communication request waiting

in queuing lines. Different types of communication requests are queued in different queuing lines associated to different groups of agents. For example, a customer's communication request for product purchase is queued in the queuing line associated to the group of MCC agents in charge of product sales. Each enterprise may have several groups of MCC agents in charge of different types of communication requests from customers.

MCC agents may be managed by supervisors. Through their monitoring terminals, the supervisors can monitor the communications between the MCC agents and the customers. The supervisors can also perform some other management operations, such as recording the communications between the MCC agents and the customers, intercepting the communications being handled by MCC agents, and taking over the communications.

The communications can also involve customers and IVR/IVVR equipment. When a customer initiates a communication, a series of interactive responses are automatically provided to him/her. The responses can use audio, video, picture or other types of media. After the customer presses specific keys on his/her terminal, the media stops playing and the process moves into the next step set up by the enterprise, such as routing the communication to the corresponding MCC agent. The interactive process can also be simplified by using automatic speech recognition (ASR). Some advanced specialized resources, such as text to speech (TTS), voice recordings, etc., can be also provided for an enhanced customer experience.

7 Service requirements

7.1 Communication requests queuing

In the MCC service, queuing of the communication requests is needed. For example, when ten customers are communicating simultaneously with an enterprise that has only five MCC agents, five of the customers have to wait in the queuing line. As soon as any MCC agent is free, the first request in the queuing line will be distributed to the MCC agent.

An enterprise can have several queuing lines. The queuing lines are associated with different groups of MCC agents. For example, communication requests for the purchase of products will be queued up in the queuing line that is associated to the group of MCC agents in charge of product sales.

Queuing lines are organized according to different policies, such as the first-come-first-served customer priority. Due to the different requirements of enterprises, policies have to be able to be different from one enterprise to another, i.e., each enterprise can configure and manage its own queuing line policies.

The MCC service has the following requirements:

1) It is required to queue up the incoming communication requests according to the different policies.
2) It is required to provide capabilities for enterprise access to configuration and management of its queuing lines and associated policies.
3) It is required to distribute the communication requests to the proper MCC agents.

7.2 Communication control operations for MCC agents

An MCC agent can perform some communication control operations after a communication has been set up, like holding the communication, transferring the communication, parking the communication, disconnecting the communication and consulting the communication. It can also push multi-media content to the customers, such as voice, video, text, etc.

NOTE 1 – Parking a communication means that the MCC agent puts the communication on hold. This MCC agent is then no longer associated with this communication, which can be retrieved by other MCC agents.

NOTE 2 – Consulting a communication means that the MCC agent puts the communication on hold and, launches another communication with another MCC agent or IVR/IVVR or any other NGN end-user. Then the customer cannot hear/see the communication between the MCC agent and the new "consulted" party.

The MCC service has the following requirements:

1) It is required to provide MCC agents with the capability to disconnect, hold, park and transfer an established communication.

2) It is required to provide MCC agents with the capability to perform consultation operations. An MCC agent may perform the following types of consultation operations:
   - communicate with another MCC agent;
   - communicate with an IVR/IVVR system;
   - communicate with any other NGN end user.

3) It is required to provide MCC agents with the capability to transfer the communication to multiple types of destinations, including: another MCC agent, the IVR/IVVR, the queuing lines and any end users in the NGN.

4) It is required to provide MCC agents with the capability to push multi-media content to customers.

5) It is required to support multiple simultaneous active sessions between a customer and an MCC agent. After a session has been established between a customer and an MCC agent, another session can be launched by the customer or the MCC agent according to the communication requirements. While establishing this latter session, special resources may be applied according to the communication requirements.

7.3 Management operations for supervisors

The MCC agents' activities, including the communications with customers, are under the management of supervisors. Supervisors can record, monitor, join and intercept communications.

In the MCC service, two monitoring patterns may be supported: the conferencing monitoring pattern and the direct monitoring pattern, as described below.

– *Conferencing monitoring pattern*

  When the monitoring request is received, a conference among the supervisor, the monitored MCC agent and the customer is created and the supervisor can hear/see the communication between the monitored MCC agent and the customer.

– *Direct monitoring pattern*

  When the monitoring request is received, the monitored MCC agent's terminal initiates the monitoring function, then the terminal sends the communication between the monitored MCC agent and the customer to the supervisor's terminal in real-time fashion, and the supervisor experiences the received communication.

The MCC service has the following requirements:

1) It is required to support recording the voice/video of the communication between an MCC agent and a customer.

2) It is required to support supervisors to monitor, join and intercept the ongoing communication handled by other MCC agents.

3) It is recommended to support coaching for MCC agents. When an MCC agent is communicating with a customer, a supervisor can hear/see the communication between the MCC agent and the customer and at the same time the supervisor has a separate communication channel with the MCC agent to support the MCC agent. The customer cannot have access to the communication between the supervisor and the MCC agent.

7.4 Charging

Enterprises have to be charged by the NGN provider for using NGN resources. There are several policies to charge enterprises, including according to the number of the enterprise's MCC agents, according to the number of the enterprise's incoming/outgoing communications and according to the number of times the enterprise's advertisements are played.

The MCC service has the following requirement:

1) It is required to support multiple charging policies for enterprises.

NOTE – This requirement is supported by the capabilities defined in [ITU-T Y.2233].

7.5 Quality of service

The quality of service (QoS) of the MCC service needs to be carefully managed. Usually, the MCC service is used by enterprises to provide product support and respond to information inquiries from consumers. If the MCC service is not supported with sufficient QoS, then the business of the enterprises may be impacted.

The MCC service has the following requirement:

1) It is recommended to provide multiple QoS levels of MCC service to enterprises.

NOTE – Resource allocation for each enterprise depends on the QoS level assigned to the enterprise.

7.6 MCC agent management

The MCC agents of an enterprise are often divided into several groups according to the different services provided by the MCC agents. Thus, an enterprise can have several groups of MCC agents. MCC agents are managed through their attributes, e.g., the information on the group of MCC agents, etc.

The MCC service has the following requirement:

1) It is required to support MCC agent management.

7.7 Video sharing between MCC agents and customers

Video sharing allows one or more MCC agents and one or more customers to watch a video clip at the same time. For example, during a voice communication between an MCC agent and a customer, if the customer/agent cannot communicate appropriately with the other side, he/she can use video sharing to play a video clip to the other side. After sharing the video, they can continue talking.

The MCC service has the following requirement:

1) It is required to support video sharing among one or more MCC agents and one or more customers.

7.8 Video conferencing

Three or more parties, which include at least one MCC agent acting as a sponsor, can communicate by video conference. The sponsor of the conference can see all the parties on his/her screen. The sponsor has the right to invite other customers into the conference as well as to release their participation from the conference. The sponsor can record videos of (part of) the conference.

Moreover, subconferencing may be used: two or more participants communicate in a main conference, while two or more of them also communicate in a private conference and can still hear/see the main conference in the background. However, the other participants in the main conference cannot hear/see the private conference.

The MCC service has the following requirements:

1) It is required to support video conferencing, which includes at least one MCC agent among the conference participants.

2) Subconferencing can optionally be supported.

7.9 Web and application collaboration

Web and application collaboration allow an MCC agent to interact with a customer or another MCC agent via multiple types of collaboration:

– web collaboration implements collaboration through a web browser;

– application collaboration implements collaboration through other means except web browsing, e.g., application collaboration via the use of instant messages (IM), file transfer, whiteboard sharing, etc.

The MCC service has the following requirements:

1) It is recommended to provide MCC agents or customers with the capability to initiate web and application collaboration anytime during the communication.

2) It is recommended to support information sharing in the process of web and application collaboration.

3) It is recommended to support MCC agents' awareness of users' context information when launching web and application collaboration.

7.10 User context information

In the MCC service, when a customer makes an incoming communication or an MCC agent makes an outgoing communication, the MCC applications acquire the customer's user context information. The customer's user context information includes the customer's communication state information (e.g., busy, mobile phone not in service etc.), the customer's specific context information (e.g., at lunch, in a meeting, etc.) and the customer's location information. For the incoming communication requests, they are distributed to the appropriate MCC agents according to the user context information. For example, if the enterprise's MCC agents are located in different places, when a customer initiates a communication request to the enterprise, this communication request might be handled by the nearest MCC agent. For outgoing communications, by using the customer's user context information, MCC agents can determine when and how to make an outgoing communication to the customers.

The MCC service has the following requirements:

1) It is required to support distribution of the incoming communication requests to the appropriate MCC agents according to the customers' user context information.

2) It is required to provide MCC agents with the capability to make outgoing communications according to customers' user context information.

3) It is required to support access to customers' user context information by MCC agents and MCC applications.

7.11 Communication congestion handling

In the MCC service, when communication congestion occurs because of resource limitations to handle the communication, the communication is rejected and an appropriate notification is sent to the NGN. The NGN plays an appropriate announcement to customers trying to access the service.

1) It is recommended to support a communication congestion handling mechanism in the MCC service.

8 NGN capability requirements

This clause describes capability requirements additional to those in [ITU-T Y.2201] for the support of the MCC service in NGN.

The MCC service requires interaction between the NGN and MCC applications. NGN is deployed and managed by the NGN provider, while MCC applications are deployed and managed by the enterprises.

Figure 2 shows the capability groupings for support of the MCC service (shown using hatched boxes) positioned within the NGN architecture overview [ITU-T Y.2012].

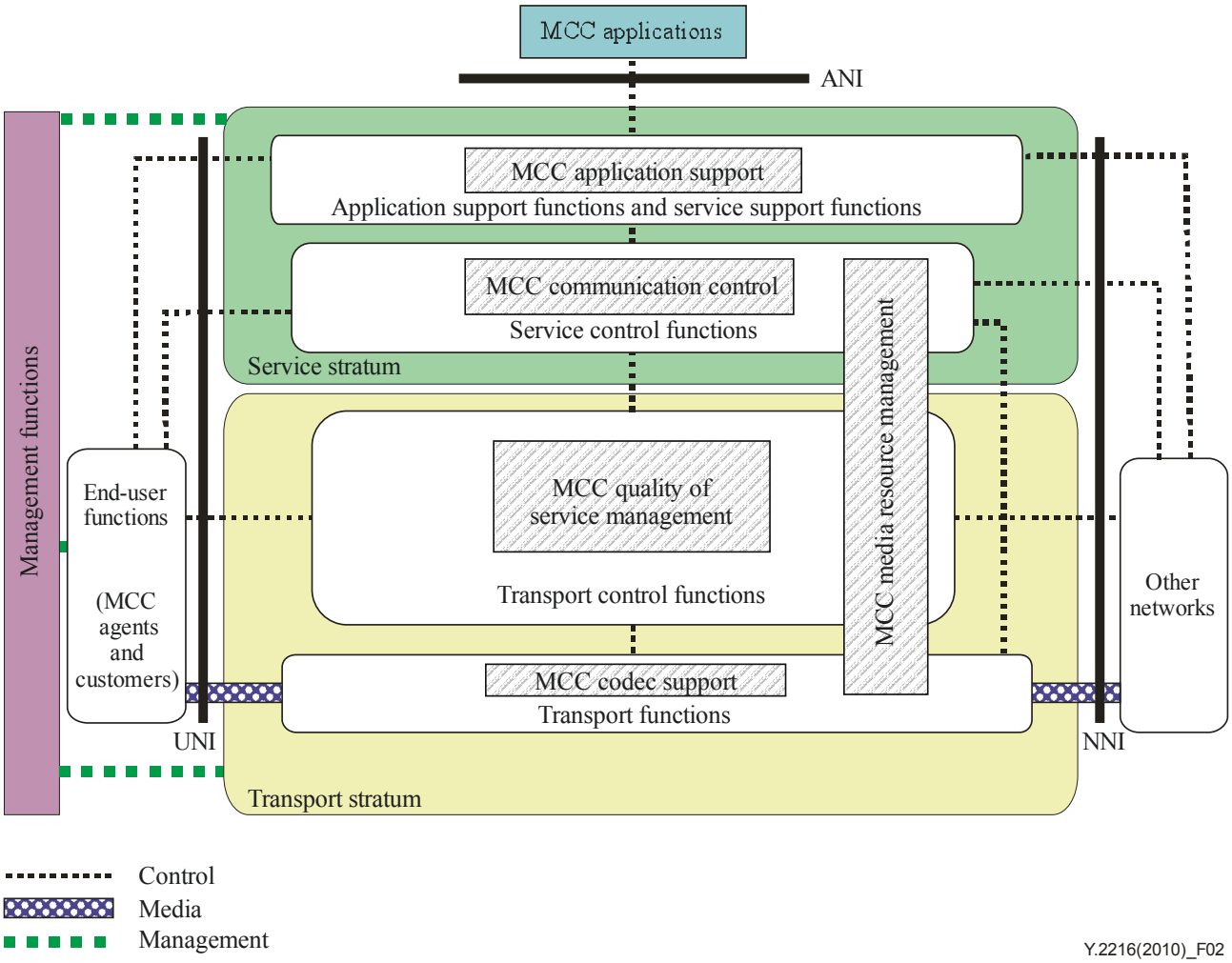

Figure 2 – Capability groupings for support of the MCC service

8.1 MCC application support

8.1.1 Communication request queuing

According to the service requirements in clause 7.1, the NGN has to support queuing up the incoming communication requests according to the queuing policies. Moreover, the MCC service has to support queuing up all kinds of communication requests, including web and application collaboration communication requests. The NGN also has to provide capabilities for enterprise access for configuring and managing the enterprise's queuing lines associated policies.

These service requirements are implemented by MCC application support capabilities of the NGN service stratum through the interactions via ANI with MCC applications. Through the interactions, MCC application support capabilities get the policies of queuing lines from MCC applications,

while MCC applications also get the information and status of the queuing lines from MCC application support capabilities.

In order to support the MCC service, the NGN has the following communication request queuing requirements:

1) The NGN is required to support the interactions for communication request queuing between MCC applications and MCC application support capabilities.
2) The NGN is required to support queuing of the incoming communication requests according to queuing policies.
3) The NGN is required to support queuing of multiple communication requests from one single customer.
4) The NGN is required to support queuing of the incoming communication requests according to the customer's user-context information so that the communication requests will be distributed to the appropriate MCC agents.
5) The NGN is recommended to support queuing of web and application collaboration communication requests initiated by the customer.

8.1.2 Communication request distribution

According to the service requirements in clause 7.1, communication requests are distributed to the proper MCC agents. In single session communications, once one of the proper MCC agents is free, his/her availability is notified to the MCC applications, and then the MCC applications request the MCC application support capabilities to pick up one of the communication requests in the queuing lines and perform the processing in order to distribute the communication request to the MCC agent. On the other hand, in multiple-session communications, the requests of the following sessions will be directly distributed to the same MCC agent (the one involved in the already established session(s)).

These service requirements are implemented by MCC application support capabilities of the NGN service stratum through the interactions via ANI with MCC applications. Through the interactions, MCC application support capabilities will be requested by MCC applications to distribute the communication requests to the proper MCC agents.

In order to support the MCC service, the NGN has the following communication request distribution requirements:

1) The NGN is required to support the interactions for communication request distribution between MCC applications and MCC application support capabilities.
2) The NGN is required to support multiple session communications from a single customer to be distributed directly to the same MCC agent without waiting time.
3) The NGN is recommended to support web and application collaboration communication requests to be distributed directly to the appropriate MCC agents without waiting time.

8.1.3 Communication control operations for MCC agents

According to the service requirements in clause 7.2, the NGN is required to provide MCC agents with the capability to disconnect, hold, park, transfer and consult an established communication. The MCC agents perform these communication control operations by accessing the MCC applications through the interface between MCC agents and MCC applications. Then MCC applications notify MCC application support capabilities in order to complete the communication control operations for MCC agents.

These service requirements are implemented by MCC application support capabilities of the NGN service stratum through the interactions via ANI with MCC applications. Through the interactions,

MCC application support capabilities will be requested by MCC applications to complete the communication control operations for MCC agents.

In order to support the MCC service, the NGN has the following communication control requirements:

1) The NGN is required to support the interactions for communication control operations of MCC agents between MCC applications and MCC application support capabilities.
2) In case of multiple session communications between one customer and one MCC agent, the NGN is required to support any of the sessions of the multiple session communications to be interrupted without affecting the other ongoing sessions.
3) The NGN is required to provide MCC agents with the capability to perform communication control operations according to customers' user context information.
4) The NGN is required to provide MCC agents with the capability to inquire customers' user context information.
5) The NGN is recommended to provide MCC agents with the capability to extend an existing one-to-one communication to a conference by initiating communication(s) towards other customers or MCC agents.

8.1.4 MCC agents' terminal management

MCC agents' terminals are managed by MCC application support capabilities. An identification is assigned to an MCC agent's terminal, and the MCC agent registers the terminal to the MCC application support capabilities using the assigned identification.

In order to support the MCC service, the NGN has the following MCC agents' terminal management requirement:

1) The NGN is required to support identification assignment and registration for MCC agents' terminals.

8.1.5 Web and application collaboration handling

In order to support the MCC service, the NGN has the following web and application collaboration handling requirement:

1) The NGN is recommended to support interactions between the web and application collaboration functions and MCC application support capabilities to establish web and application collaboration communications.

8.1.6 Communication congestion handling

In order to support the MCC service, the NGN has the following communication congestion handling requirement:

1) The NGN is recommended to support the MCC application support capabilities' notification to the NGN service control function when communication congestion occurs in the MCC service.

8.2 MCC media resource management

The MCC service can provide various media resources to customers, like IVR/IVVR, ASR, TTS, announcement playing, recording resources, etc. For different enterprises, the mechanisms of managing these media resources are different. The mechanisms of media resource management are provided by MCC applications, and are set and managed by the enterprises themselves. So the MCC applications need to interact with the media resource management in NGN. In order to support the MCC service, the NGN has the following media resource management requirement:

1) The NGN is required to support an interface between MCC applications and the NGN to manage media resources.

In addition, in order to support the MCC service, the NGN has other media resource management requirements as follows:

2) The NGN is required to support NAT/NAPT between the media resources in NGN and MCC applications.

3) The NGN is required to support video-related operations, including lip synchronization (synchronization between video and voice), video corruption (returning the specific cause of failure when a video communication fails).

4) The NGN is required to support media stream control by customers, including video pausing, stopping, replaying, slowing and speeding, etc.

5) The NGN is required to support DTMF recognition when media is played to the customers.

6) The NGN is required to support playing media to all or part of the participants during a conference.

7) The NGN is recommended to support multiple audio formats: AMR/AMR2 [ATIS.3GPP.26.071V600-2006], [ITU-T G.711], [ITU-T G.723.1], [ITU-T G.729 – Annex A], AMR-WB [ITU-T G.722.2], EVRC/EVRC-B [TIA-127-C].

8) The NGN is recommended to support media forking in a conference.

NOTE – In this Recommendation, media forking means that the sponsor in the conference can hear/see the voice/video from all the other participants, but the other participants can only hear/see the voice/video from the sponsor.

9) The NGN is recommended to support distributed media resource deployment and enable customers to communicate with the appropriate media resources when they experience the MCC service.

8.3 MCC communication control

8.3.1 Communication control operations for MCC agents

According to the requirements in clauses 7.2 and 8.1.3, NGN has the following requirements of communication control operations for MCC agents in order to support the MCC service:

1) The NGN is required to support communication control to disconnect, hold, park, transfer and consult a communication according to the request from MCC application support capabilities.

2) The NGN is recommended to support the correlation of sessions for multiple session communications involving one customer.

8.3.2 Management operations for supervisors

According to the service requirements in clause 7.3, supervisors manage MCC agents.

In order to support the MCC service, the NGN has the following requirements of management operations for supervisors:

1) The NGN is required to support the capability of media recording.

2) The NGN is required to support the capability of monitoring communications.

3) In case of a multiple session communication between one customer and a single MCC agent, the NGN is required to support any session of the multiple session communication to be monitored and recorded.

4) The NGN is required to support the capability of joining communications.

5) The NGN is required to support the capability of interrupting communications.

6) The NGN is recommended to support the capability of MCC agent coaching.

7) The NGN can optionally support the capability of direct monitoring.

8.3.3 Communication routing

The NGN has the following requirement in order to support the MCC service:

1) The NGN is required to support the capability of routing communications according to customers' user context information.

8.4 MCC codec support

In order to support the MCC service when different types of codecs are used, the NGN has the following requirements for codec support:

1) The NGN is recommended to support audio transcoding between AMR [ATIS.3GPP.26.071V600-2006], EVRC/EVRC-B [TIA-127-C], [ITU-T G.711], [ITU-T G.723.1] and [ITU-T G.729 – Annex A].

2) The NGN is recommended to support video transcoding between MPEG-4 advanced simple profile [ISO/IEC 14496-2], [ITU-T H.263], [ITU-T H.264] and AVS [GB/T20090.2].

8.5 MCC quality of service management

The MCC service is recommended to provide multiple QoS levels to enterprises. In order to support the MCC service, the NGN has the following quality of service management requirement:

1) The NGN is recommended to support resource allocation for enterprises according to the required different QoS levels.

9 Security considerations

The security requirements for the MCC service are addressed by the security requirements for NGN in [ITU-T Y.2701] and the authentication and authorization requirements for NGN in [ITU-T Y.2702]. No additional security requirements have been identified for the MCC service.

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