Method, system and application server for processing service application request

TECHNICAL FIELD

The disclosure relates to communication field, in particular to a method and an Application Server (AS) for processing a service application request, and a system for processing the service application request.

BACKGROUND

In Next Generation Network (NGN) environment, signaling between respective network elements can be controlled by a Session Initiation Protocol (SIP). Generally, a Soft Switch (SS) device is in charge of the access of a user terminal and simple service applications, while the AS can implement various complex service applications and command a Media Server (MS) to implement the functions corresponding to the service application, such as playback, number receiving, recording, fax, session and the like.

In the relevant art, an AS can serve multiple SS devices, but different SS devices may be distributed in different regions, and the MS available to the AS may also be distributed in different regions, therefore, during the implementation, it occurs often that a user in region A triggers the service application on the AS through local SS device (i.e., SS device in region A), but the AS uses the MS in region B, the MS in region B implements the function corresponding to the service application designated by the AS and responds to the user in region A with it, which will reduce the implementation efficiency of the service application and affect the using feeling and experience of the user.

In order to solve the technical problem, the relevant art provides to order the AS to select the corresponding MS according to the number of the user, however, in the existing NGN network environment, number and region is not highly correlated and the problem of low implementation efficiency of the service application remains unsolved.

SUMMARY

One embodiment of the disclosure provides a method for processing a service application request to search for an MS which is in the same region as an SS device, and improve the implementation efficiency of the service application, including:

receiving a service application request sent by an SS device and acquiring an

identifier of the SS device;

determining, according to a mapping relationship between the identifier of the SS device and MS identifiers, at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device; and

sending the service application request to the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device.

Determining at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device may include:

determining the MS identifiers corresponding to the acquired identifier of the SS device and selecting at least one MS identifier from the determined MS identifiers; and

searching for the MS corresponding to the at least one MS identifier.

Selecting at least one MS identifier from the determined MS identifiers may include:

selecting at least one MS identifier from the determined MS identifiers according to a set strategy, wherein the set strategy includes any one or a combination of the following strategies: polling strategy, load balancing strategy, and random selection strategy.

The method may further include: when there is no MS identifier corresponding to the acquired identifier of the SS device, determining another MS which can execute the service application request and sending the service application request to the another MS.

The method may further include: when the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device and the another MS do not exist, notifying the SS device that the service application request is invalid.

One embodiment of the disclosure further provides an AS to search for the MS which is in the same region as the SS device, and improve the implementation efficiency of the service application, including:

an acquiring module configured to receive a service application request sent by an SS device and acquire an identifier of the SS device;

a determining module configured to determine, according to a mapping relationship between the identifier of the SS device and MS identifiers, at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device; and

a first sending module configured to send the service application request to the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device.

The determining module may include:

a determining sub-module configured to determine the MS identifiers corresponding to the acquired identifier of the SS device and select at least one MS identifier from the determined MS identifiers; and

a searching sub-module configured to search for the MS corresponding to the at least one MS identifier.

The determining sub-module may be further configured to: select at least one MS identifier from the determined MS identifiers according to a set strategy, wherein the set strategy includes any one or a combination of the following strategies: polling strategy, load balancing strategy, and random selection strategy.

The AS may further include: a second sending module configured to determine another MS which can execute the service application request when there is no MS identifier corresponding to the acquired identifier of the SS device, and send the service application request to the another MS.

The AS may further include: a notifying module configured to notify the SS device that the service application request is invalid when the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device and the another MS do not exist.

One embodiment of the disclosure further provides a system for processing a service application request to search for the MS which is in the same region as the SS device, and improve the implementation efficiency of the service application, including:

at least one SS device configured to send a service application request;

an AS configured to receive the service application request sent by the SS device and acquire an identifier of the SS device, determine, according to a mapping relationship between the identifier of the SS device and MS identifiers, at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device, and send the service application request to the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device; and

at least one MS configured to receive the service application request sent by the AS and execute service application corresponding to the service application request.

In the embodiments of the disclosure, instead of selecting the MS located in a different region to execute the service application as provided in the relevant art, the MS which is in the same region as the SS device can be accurately searched by determining at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device according to the mapping relationship between the identifier of the SS device and the MS identifiers, resulting in improved implementation efficiency of the service application and enhanced using feeling and experience of the user.

Furthermore, with the method for processing the service application request provided by embodiments of the disclosure, it is only necessary to make corresponding improvement to the AS without the need to improve at the same time the other devices in the NGN network environment, such as the SS device, the MS, and other multiple kinds of devices, which enables resource saving and improved device utilization rate during implementation.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a specific flowchart of a method for processing a service application request provided by one embodiment of the disclosure;

Fig. 2 is a diagram showing the first structure of an AS provided by one embodiment of the disclosure;

Fig. 3 is a diagram showing the specific structure of a determining module provided by one embodiment of the disclosure;

Fig. 4 is a diagram showing the second structure of an AS provided by one embodiment of the disclosure;

Fig. 5 is a diagram showing the third structure of an AS provided by one embodiment of the disclosure;

Fig. 6 is a diagram showing the structure of a system for processing a service application request provided by one embodiment of the disclosure;

Fig. 7 is a diagram showing the specific processing flow for the normal execution of a playback service provided by one embodiment of the disclosure; and

Fig. 8 is a diagram showing the specific processing flow for the failed execution of a

playback service provided by one embodiment of the disclosure.

DETAILED DESCRIPTION

In order to solve the problem that the service application provided by the relevant art has low implementation efficiency which affects the using feeling and experience of the user, one embodiment of the disclosure provides the method for processing the service application request, with the specific processing flow shown in Fig. 1, including:

step 101: Receiving the service application request from the SS device and acquiring the identifier of the SS device;

step 102: Determining at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device according to the mapping relationship between the identifier of the SS device and the MS identifiers;

step 103: Sending the service application request to at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device.

In the embodiment of the disclosure, during the implementation of step 102, multiple implementation ways can be adopted to determine at least one MS which is in the same region as the SS device mentioned in step 101, and a preferred embodiment is provided in the embodiment, i.e., determining the MS identifiers corresponding to the acquired identifier of the SS device, selecting at least one MS identifier from the determined MS identifiers, and furthermore, searching for the MS corresponding to at least one MS identifier. During implementation, other implementation ways can also be adopted, as long as the MS which is in the same region as the SS device mentioned in step 101 can be determined.

Of course, during the implementation of step 102, the mapping relationship can further include other aspects, for example, in another mapping relationship, the MS identifier corresponding to the identifier of the SS device is the identifier of the MS that is currently least loaded, and the specific mapping relationship can depend on the specific circumstance.

In the specific implementation, there may be multiple MSs located in the same region, correspondingly, in the stored mapping relationship, there may be also multiple MS identifiers corresponding to the identifier of the SS device, under such circumstance, it is necessary to select at least one MS identifier from the multiple MS identifiers. Generally, it may be selected according to a set strategy, for example, polling strategy,

wherein the corresponding MS of each MS identifier is sequentially queried, if the MS being queried can execute the service request corresponding to the service application request, the MS is selected; if the MS being queried cannot execute the service request corresponding to the service application request, the query is carried on with the next MS untill all the MSs are queried. Of course, other strategies can also be adopted, such as random selection strategy, i.e., randomly selecting one MS from the multiple MSs corresponding to multiple MS identifiers to execute the service request corresponding to the service application request; and load balancing strategy, wherein considering the current load of the MS corresponding to each MS identifier, the MS with less load is selected to execute the service request corresponding to the service application request. In specific implementation, other strategies can also be adopted as long as they can select an MS.

In order to improve the execution efficiency of the service application request, in the embodiments of the disclosure, both the service application request sent by the SS device and/or that received by the MS are based on the SIP. Of course, other protocols, such as HyperText Transfer Protocol (HTTP) can also be adopted, as long as the two signaling interaction parties adopt the same protocol.

During implementation, it is also possible that there is no MS identifier corresponding to the acquired identifier of the SS device, in which case the SS device is notified that the service application request is invalid. Of course, one MS may also be selected from other connectable MSs to serve the service application request, and the service application request is sent to the other selected MS. The specific way of implementation depends on the specific circumstance.

Based on the same inventive concept, one embodiment of the disclosure further provides an AS, as shown in Fig. 2, including:

an acquiring module 201 which is configured to receive the service application request sent by the SS device and acquire the identifier of the SS device;

a determining module 202 which is configured to determine at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device according to the mapping relationship between the identifier of the SS device and the MS identifiers; and

a first sending module 203 which is configured to send the service application request to the at least one MS which is in the same region as the SS device

corresponding to the identifier of the SS device.

In one embodiment, as shown in Fig. 3, the determining module 202 may specifically include:

a determining sub-module 301 which is configured to determine the MS identifiers corresponding to the acquired identifier of the SS device and select at least one MS identifier from the determined MS identifiers; and

a searching sub-module 302 which is configured to search for the MS corresponding to the at least one MS identifier.

In one embodiment, the determining sub-module 301 is specifically configured to: select at least one MS identifier from the determined MS identifiers according to a set strategy, wherein the set strategy includes any one or a combination of the following strategies: polling strategy, load balancing strategy, and random selection strategy.

In one embodiment, as shown in Fig. 4, the AS may further include:

a second sending module 401 which is configured to determine the other MS which can execute the service application request and send the service application request to the MS when there is no MS identifier corresponding to the acquired identifier of the SS device.

In one embodiment, as shown in Fig. 5, the AS can further include: a notifying module 501 which is configured to notify the SS device that the service application request is invalid when the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device and the other MS do not exist.

Based on the same inventive concept, one embodiment of the disclosure further provides a system for processing the service application request, as shown in Fig. 6, including:

at least one SS device 601 which is configured to send the service application request;

an AS 602 which is configured to receive the service application request from the SS device 601 and acquire the identifier of the SS device 601, determine the MS identifiers corresponding to the acquired identifier of the SS device 601 according to the stored mapping relationship between the identifier of the SS device and the MS identifiers, select at least one MS identifier from the determined MS identifiers, search for

the MS 603 corresponding to the at least one MS identifier, and send the service application request to the corresponding MS 603, wherein in the mapping relationship, the SS device corresponding to the identifier of the SS device is in the same region as the MS corresponding to the MS identifier; and

at least one MS 603 which is configured to receive the service application request from the AS 602 and execute the service application corresponding to the service application request.

Fig. 6 is merely a diagram of a system for processing a service application request provided by one embodiment of the disclosure, the number of the SS device 601 and MS 603 is not necessarily three, but may be two, four, or more, depending on specific circumstances.

During the specific implementation of the embodiments of the disclosure, it is only necessary to make corresponding improvement to the AS without the need to make improvement to the SS device, MS, or other network elements in the NGN network environment, enabling resource saving and improved device utilization rate.

The method and the system for processing the service application request provided by the embodiments of the disclosure can be applied to multiple services such as playback, number receiving, recording, fax, session, and the like, which are now described with a specific example, in the embodiments of the disclosure, the SIP will be used in all signaling interaction involving playback service; As can be seen from the above embodiments, during implementation, it is possible that the MS which is in the same region as the SS device or another MS is selected to execute the service application, or no MS can be selected, causing the service application to be invalid, which two circumstances are described herein, respectively:

The specific processing flow under the first circumstance is as shown in Fig. 7:

step 701: A User Equipment (UE) calls in the NGN network through an SS device and sends a service application request by an invite (INVITE) message, wherein the INVITE message includes the Session Description Protocol (SDP) of the UE;

step 702: The SS device triggers a service application on the AS with the INVITE message;

step 703: The AS identifies the SS device forwarding the current call and selects an MS to execute the service application request, wherein

multiple implementation ways can be adopted to select an MS to execute the service application request, for example, the MS which is in the same region as the current SS device may be searched according to the mapping relationship stored on the AS, if there are multiple MSs in the same region, one MS for executing the service application request can be selected by the polling strategy or other strategies; if there is no MS in the same region as the current SS device, one MS for executing the service application request can be selected from all the MSs that can be commanded by the AS by polling or other strategies;

step 704: The AS sends the INVITE message to the MS which is selected to execute the service application request;

step 705: The MS which is selected to execute the service application request replies to the AS with 200 OK (i.e., acknowledgment) message, wherein the 200 OK message includes the SDP of the MS which is selected to execute the service application request;

step 706: The AS forwards the 200 OK message including the SDP of the MS which is selected to execute the service application request to the SS device;

step 707: The SS device responds to the UE with the 200 OK message including the SDP of the MS which is selected to execute the service application request;

step 708: The UE makes a service application response to the SS device;

step 709: The SS device sends a response acknowledgment (ACK) message to the AS which executes the service application request;

step 710: The AS forwards the ACK message to the MS which executes the service application request;

step 711: The AS initiates an information (INFO) message to the MS, which includes a playback instruction;

step 712: The MS which executes the service application request returns 200 OK message corresponding to the INFO message to the AS;

step 713: The MS which executes the service application request carries out playback service.

The specific processing flow under the second circumstance is as shown in Fig. 8:

step 801: The UE calls in the NGN network through the SS device and sends the

service application request by the INVITE message, wherein the INVITE message includes the SDP of the UE;

step 802: The SS device triggers a service application on the AS with the INVITE message;

step 803: The AS identifies the SS device forwarding the current call and selects an MS to execute the service application request;

step 804: If there is no MS which can execute the service application request at the moment, the AS notifies the SS device that the service application request is invalid; there is no MS which can execute the service application request, including that there is no MS in the same region as the current SS device, further including that there is no MS selected from all the MSs which can be commanded by the AS by polling or other strategies when there is no MS in the same region as the current SS device;

step 805: The notification of the invalidness of the service application request is forwarded to the UE by the SS device.

During the implementation of step 804 and step 805, the information of the invalidness of the service application request of which the AS notifies the SS device can be designated from the service application itself, for example as a 480 message. The whole calling process ends after the UE receives the information that the service application request is invalid.

In the embodiments of the disclosure, instead of selecting the MS located in a different region to execute the service application as provided in the relevant art, the MS which is in the same region as the SS device can be accurately searched by determining at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device according to the mapping relationship between the identifier of the SS device and the MS identifiers, resulting in improved implementation efficiency of the service application and enhanced using feeling and experience of the user.

Furthermore, with the method for processing the service application request provided by embodiments of the disclosure, it is only necessary to make corresponding improvement to the AS without the need to improve at the same time the other devices in the NGN network environment, such as the SS device, the MS, and other multiple kinds of devices, which enables resource saving and improved device utilization rate during implementation.

Obviously, various modifications and variations of the disclosure can be made by those skilled in the art without departing from the spirit and scope of the disclosure. Thus, if such modifications and variations of the disclosure fall in the scope of the claims of the disclosure and its equivalents, the disclosure is intended to contain such modifications and variations.

Claims

What is claimed is:

1. A method for processing a service application request, comprising:

receiving a service application request sent by a Soft Switch (SS) device and acquiring an identifier of the SS device;

determining, according to a mapping relationship between the identifier of the SS device and MS identifiers, at least one Media Server (MS) which is in the same region as the SS device corresponding to the identifier of the SS device; and

sending the service application request to the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device.

2. The method according to claim 1, wherein determining at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device comprises:

determining the MS identifiers corresponding to the acquired identifier of the SS device and selecting at least one MS identifier from the determined MS identifiers; and

searching for the MS corresponding to the at least one MS identifier.

3. The method according to claim 2, wherein selecting at least one MS identifier from the determined MS identifiers comprises:

selecting at least one MS identifier from the determined MS identifiers according to a set strategy, wherein the set strategy comprises any one or a combination of strategies selected from a group consisting of polling strategy, load balancing strategy, and random selection strategy.

4. The method according to claim 1, further comprising:

determining another MS which can execute the service application request when there is no MS identifier corresponding to the acquired identifier of the SS device, and sending the service application request to the another MS.

5. The method according to claim 4, further comprising:

notifying the SS device that the service application request is invalid when the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device and the another MS do not exist.

6. An Application Server (AS), comprising:

an acquiring module, configured to receive a service application request sent by an SS device and acquire an identifier of the SS device;

a determining module, configured to determine, according to a mapping relationship between the identifier of the SS device and MS identifiers, at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device; and

a first sending module, configured to send the service application request to the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device.

7. The AS according to claim 6, wherein the determining module comprises:

a determining sub-module, configured to determine the MS identifiers corresponding to the acquired identifier of the SS device and select at least one MS identifier from the determined MS identifiers; and

a searching sub-module, configured to search for the MS corresponding to the at least one MS identifier.

8. The AS according to claim 7, wherein the determining sub-module is further configured to: select at least one MS identifier from the determined MS identifiers according to a set strategy, wherein the set strategy comprises any one or a combination of strategies selected from a group consisting of polling strategy, load balancing strategy, and random selection strategy.

9. The AS according to claim 6, further comprising:

a second sending module, configured to determine another MS which can execute the service application request when there is no MS identifier corresponding to the acquired identifier of the SS device, and send the service application request to the another MS.

10. The AS according to claim 9, further comprising:

a notifying module, configured to notify the SS device that the service application request is invalid when the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device and the another MS do not exist.

11. A system for processing a service application request, comprising:

at least one SS device, configured to send a service application request;

an AS, configured to receive the service application request sent by the SS device, acquire an identifier of the SS device, determine, according to a mapping relationship between the identifier of the SS device and MS identifiers, at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device, and send the service application request to the at least one MS which is in the same region as the SS device corresponding to the identifier of the SS device; and

at least one MS, configured to receive the service application request sent by the AS and execute service application corresponding to the service application request.