Summary

Based on this, it is necessary to provide a method and an apparatus for processing subscription message, a computer device and storage medium, aiming at the technical problem that an RCD may be in a sleep state for a long time or periodically, or cannot process a large quantity of service requests in real time, such that the RCD may not receive notification messages in time or may miss notification messages.

In a first aspect, an embodiment of the present invention provides a method for processing subscription message, including:

receiving, by a subscription device, a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier;

monitoring, by the subscription device, a target resource corresponding to the subscription resource identifier; and

sending, by the subscription device, the notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message if the subscription device monitors a change of the target resource, such that the NS device forwards the notification message to a corresponding RCD.

In an embodiment, before monitoring, by the subscription device, the target resource corresponding to the subscription resource identifier, the method further includes:

identifying, by the subscription device, whether a sending end of the subscription message has an authority of subscribing to the target resource according to a device identifier carried in the subscription message; and

storing, by the subscription device, the subscription message and sending a notification message of subscription completion to the sending end if the sending end has the authority of subscribing to the target resource.

In an embodiment, the sending end is an RCD or an NS device corresponding to the RCD.

In an embodiment, after sending, by the subscription device, the notification message to the notification server (NS) device, which is the notification proxy, according to the sending

address of the notification message, the method further includes:

receiving, by the subscription device, a notification response message sent by the NS device.

In a second aspect, an embodiment of the present invention provides a method for processing subscription message, including:

receiving, by an NS device, a notification message sent by a subscription device, wherein the notification message is used for indicating a change of a target resource subscribed by an RCD; and

sending, by the NS device, the notification message to a corresponding RCD.

In an embodiment, sending, by the NS device, the notification message to the corresponding RCD includes:

receiving, by the NS device, a query message sent by the RCD, wherein the query message includes a device identifier of the RCD;

determining, by the NS device, a target resource identifier corresponding to the device identifier of the RCD according to a correspondence between a device identifier of an RCD and a resource identifier; and

sending, by the NS device, the notification message carrying the target resource identifier to the RCD.

In an embodiment, receiving, by the NS device, the query message sent by the RCD includes:

receiving, by the NS device, the query message sent by the RCD according to a preset period.

In an embodiment, before receiving, by the NS device, the query message sent by the RCD, the method further includes:

broadcasting, by the NS device, a notification message list, wherein the notification message list includes an identification parameter used for the RCD to identify the notification message;

subscription device, the method further includes:

sending, by the NS device, a notification response message to the subscription device.

In a third aspect, an embodiment of the present invention provides a method for processing subscription message, including:

sending, by an RCD, a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; and

receiving, by the RCD, a notification message sent by an NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change of a target resource corresponding to the subscription resource identifier.

In an embodiment, sending the subscription message includes:

sending, by the RCD, the subscription message to the NS device, such that the NS device forwards the subscription message to a subscription device; or

sending, by the RCD, the subscription message to the subscription device.

In an embodiment, before receiving, by the RCD, the notification message sent by the NS device corresponding to the sending address of the notification message, the method further includes:

sending, by the RCD, a query message to the NS device, wherein the query message includes a device identifier of the RCD;

receiving, by the RCD, the notification message sent by the NS device corresponding to the sending address of the notification message includes:

receiving, by the RCD, the notification message sent by the NS device according to the query message.

In an embodiment, sending, by the RCD, the query message to the NS device includes:

sending, by the RCD, the query message to the NS device according to a preset period; or

querying, by the RCD, a notification message list broadcast by the NS device, and sending the query message to the NS device if the notification message list indicates a notification

In a fourth aspect, an embodiment of the present invention provides an apparatus for processing subscription message, including:

a first receiving module, configured to receive a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier;

a monitoring module, configured to monitor a target resource corresponding to the subscription resource identifier; and

a first sending module, configured to send the notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message if the subscription device monitors a change of the target resource, such that the NS device forwards the notification message to a corresponding RCD.

In a fifth aspect, an embodiment of the present invention provides an apparatus for processing subscription message, including:

a second receiving module, configured to receive a notification message sent by a subscription device, wherein the notification message is used for indicating a change of a target resource subscribed by an RCD; and

a second sending module, configured to send the notification message to a corresponding RCD.

In a sixth aspect, an embodiment of the present invention provides an apparatus for processing subscription message, including:

a third sending module, configured to send a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; and

a third receiving module, configured to receive a notification message sent by an NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change of a target resource corresponding to the subscription resource identifier.

In a seventh aspect, an embodiment of the present invention provides a computer device

including a memory and a processor, wherein a computer program is stored in the memory, and when executing the computer program, the processor implements the following acts:

receiving, by a subscription device, a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; monitoring, by the subscription device, a target resource corresponding to the subscription resource identifier; and sending, by the subscription device, a notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message if the subscription device monitors a change of the target resource, such that the NS device forwards the notification message to a corresponding RCD;

or,

receiving, by an NS device, a notification message sent by a subscription device, wherein the notification message is used for indicating a change of a target resource subscribed by an RCD; and sending, by the NS device, the notification message to a corresponding RCD;

or,

sending, by an RCD, a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; and

receiving, by the RCD, a notification message sent by an NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change of a target resource corresponding to the subscription resource identifier.

In an eighth aspect, an embodiment of the present invention provides a computer readable storage medium on which a computer program is stored, wherein when executed by a processor, the computer program implements the following acts:

receiving, by a subscription device, a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; monitoring, by the subscription device, a target resource corresponding to the subscription resource identifier; and sending, by the subscription device, a notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message if the subscription device monitors a change of the target

resource, such that the NS device forwards the notification message to a corresponding RCD;

or,

receiving, by an NS device, a notification message sent by a subscription device, wherein the notification message is used for indicating a hange of a target resource subscribed by an RCD; and sending, by the NS device, the notification message to a corresponding RCD;

or,

sending, by an RCD, a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; and

receiving, by the RCD, a notification message sent by an NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change of the target resource corresponding to the subscription resource identifier.

According to the method and apparatus for processing subscription message, the computer device and the storage medium provided by the embodiments of the present application, the subscription device first receives the subscription message including the sending address of the notification message and the subscription resource identifier, then monitors the target resource corresponding to the subscription resource identifier in the subscription message, and sends the notification message to the NS device when the target resource changes, such that the NS device forwards the notification message to the corresponding RCD. When the RCD is in a sleep state for a long time or periodically, or cannot process a large quantity of service requests in real time, the subscription device can forward the message needed by the RCD through the NS device, such that the RCD can receive messages in time without missing any message, which greatly improves the success rate of message acquisition of the RCD.

the subscription device includes: from: 3rd device; to: RCD; op: notify; payload:{ resouce}. In the above, the manner in which the subscription device sends the notification message to the NS device and the manner in which the NS device forwards the notification message to the RCD may both be transmission through wireless communication, such as WIFi, infrared communication or 3G, 4G, 5G, which is not limited in this embodiment.

According to the method for processing subscription message provided by this embodiment, the subscription device first receives the subscription message including the sending address of the notification message and the subscription resource identifier, then monitors the target resource corresponding to the subscription resource identifier in the subscription message, and sends the notification message to the NS device when the target resource changes, such that the NS device forwards the notification message to the corresponding RCD. When the RCD is in the sleep state for a long time or periodically, or cannot process a large quantity of service requests in real time, the subscription device can send the message needed by the RCD to the NS device, and the NS device can forward the notification message to the RCD when the RCD is in a working state, such that the RCD can receive messages in time without missing any message, which greatly improves the success rate of message acquisition of the RCD.

Because in some scenarios, in order to ensure that the resources in the subscription devices are subscribed by safe and reliable devices, an authority of each sending end of subscription message may be identified. Therefore, an embodiment of the present application provides a method for processing subscription message, and the this embodiment relates to a specific process in which a subscription device identifies, according to a device identifier of a sending end of the subscription message carried in the subscription message, an authority of subscribing to a target resources by the sending end of the subscription message. As shown in FIG. 3, the method further includes acts S201 and S202.

In S201, a subscription device identifies whether a sending end of a subscription message has an authority of subscribing to a target resource according to a device identifier carried in the subscription message.

In this embodiment, the subscription device identifies whether the sending end of the

the NS device according to the sending address of the notification message, in this way, if the subscription device receives the notification response message sent by the NS device, it indicates that the notification message sent by the subscription device is successfully sent, which greatly improves the success rate of message sending by the subscription device.

Embodiments in which the executor is an NS device will be described below. It should be noted that some of the contents involved in the following embodiments are already described in the above embodiments in which the executor is the subscription device, and the repeated contents will not be described again.

In an embodiment, FIG. 4 provides a method for processing subscription message, this embodiment relates to a specific process in which an NS device receives a notification message sent by a subscription device and forwards the notification message to an RCD. As shown in FIG. 4, the method includes acts S301 and S302.

In S301, an NS device receives a notification message sent by a subscription device, wherein the notification message is used for indicating a change of a target resource subscribed by an RCD.

Specifically, the NS device receives the notification message sent by the subscription device, wherein the notification message is used for indicating that the target resource subscribed by the RCD has changed. For example, if the subscription device monitors that the working state of the target resource subscribed by RCD has changed, it will send the notification message to the NS device. For the specific format and sending mode of the notification message, reference may be made to the description in FIG. 2, which will not be repeated here.

S302, the NS device sends the notification message to a corresponding RCD.

Based on the above act S301, the NS device receives the notification message sent by the subscription device and sends the notification message to the corresponding RCD, wherein sending the notification message to the corresponding RCD by the NS device may be that the NS device sends the notification message to the RCD actively or that the NS device sends the corresponding notification message to the RCD after receiving the acquisition message sent by the RCD.

According to the method for processing subscription message provided by this embodiment, the NS device first receives the notification message sent by the subscription device that the target resource subscribed by the RCD has changed, and then forwards the notification message to the RCD, such that when the RCD is in the sleep state for a long time or periodically, or the RCD cannot process a large quantity of service requests in real time, the subscription device can forward the message needed by the RCD through the NS device, such that the RCD can receive messages in time without missing any message, which greatly improves the success rate of message acquisition of the RCD.

Optionally, after the NS device receives the notification message sent by the subscription device, the method further includes: the NS device sends a notification response message to the subscription device. In this embodiment, the NS device sends the notification response message to the subscription device, such that the subscription device can determine that the notification message is sent successfully, and then subsequent notification messages can be sent to the NS device normally, thereby ensuring the success rate of message acquisition of the RCD and improving the communication quality.

On the basis of the above embodiments, this embodiment provides a method for processing subscription message, this embodiment relates to a specific process in which the NS device sends a notification message to a corresponding RCD according to a query message sent by the RCD. As shown in FIG. 5, the above act S302 includes S401, S402, and S403.

In S401, the NS device receives a query message sent by the RCD, wherein the query message includes a device identifier of the RCD.

In the above, the NS device receives the query message sent by the RCD, wherein the query message indicates that the RCD queries whether the NS device has a notification message needed by the RCD, and the query message includes the device identifier of the RCD, which represents an identity of the RCD, and the identifier may be a number, a letter or a combination of a number and a letter. In this embodiment, the identifier of the RCD is not limited. Optionally, the RCD may send a query message to the NS device periodically, or send a query message to the NS device after the RCD exits the sleep mode, or the RCD may send a query message to the NS device after knowing that the NS device has a notification message needed

executor is the NS device, and the repeated contents will not be described in detail.

In an embodiment, FIG. 9 provides a method for processing subscription message, this embodiment relates to a specific process in which the RCD sends a subscription message and receives a notification message sent by an NS device corresponding to a sending address of the notification message included in the subscription message. As shown in FIG. 9, the method includes S801 and S802.

In S801, an RCD sends a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier.

In this embodiment, the RCD sends a subscription message, which may be sent to the NS device or a subscription device. The subscription message is used for intending to receive a notification message generated when the target resource changes, wherein the sent subscription message includes the sending address of the notification message and the subscription resource identifier.

In S802, the RCD receives the notification message sent by the NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change of the target resource corresponding to the subscription resource identifier.

Based on the subscription message sent by the RCD in act S801, the RCD receives the notification message sent by the NS device, wherein the notification message represents a notification message sent by the subscription device after the resource subscribed by the RCD changes. It should be noted that no matter whether the RCD sends the subscription message to the NS device or to the subscription device, when the notification message is sent, the subscription device always sends the notification message first to the NS device, and then the NS device sends the notification message to the RCD.

According to the method for processing subscription message provided by this embodiment, after the RCD first sends the subscription message (which is to be forwarded by the NS device to subscription device) to NS device or the subscription device, the subscription device will send a notification message to the NS device after the resource subscribed by the RCD has changed, and then the RCD receives the notification message sent by the NS device.

the RCD receives the notification message of subscription completion, if the RCD sends the subscription message to the NS device, the RCD receives notification message of subscription completion sent by the NS device, and if the RCD sends the subscription message to the subscription device, the RCD receives the notification message of subscription completion sent by the subscription device. In this way, the RCD determines that the RCD or its corresponding NS device has the authority of subscribing to the target resource according to the received notification message of subscription completion, thereby further ensuring the success rate of message acquisition of the RCD.

Since the RCD may be in a state in which messages cannot be received normally, it is necessary to select an NS device to help the RCD to receive notification messages, that is, it is necessary to find a device with resources needed by the RCD to act as a proxy device. In an embodiment, the embodiment of the present application provides a method for processing subscription message. This embodiment relates to a specific process in which an RCD sends a resource creation request to an NS device and receives a first response message sent by the NS device, as shown in FIG. 10, the method further includes S901 and S902.

In S901, an RCD sends a resource creation request to an NS device, wherein the resource creation request is used for requesting to create a proxy resource on the NS device determined by the RCD.

In the above, the proxy resource created here represents a type of resource needed by the RCD. The resource creation request sent by the RCD is used for requesting to create the proxy resource on the NS devices determined by the RCD, that is, the NS device sent by the RCD is a proxy device selected by the RCD, and the RCD requests the proxy device (the NS device) to create the proxy resource.

In S902, the RCD receives a first response message sent by the NS device, wherein the first response message includes a sending address of the notification message.

Based on the above act S901, the RCD sends the resource creation request to the NS device, and the NS device will send a first response message to the RCD according to the type of the resource requested to be created. In the above, the first response message indicates that the NS device has successfully created the resource. In the above, the first response message

includes the sending address of the notification message, such that the RCD can correctly receive subsequent notification messages according to the address.

According to the method for processing subscription message provided by this embodiment, the RCD sends the resource creation request to the NS device and receives the first response message generated after the NS device receives the resource creation request successfully. In this way, after receiving the first response message, the RCD correctly receives the subsequent notification messages according to the address of the notification message carried in the first response message, which greatly ensures the accuracy of messages acquired by the RCD.

With regard to the process of selecting a proxy device by the RCD, an embodiment of the present application provides a method for processing subscription message, which relates to a specific process in which the RCD determines a target NS device, as shown in FIG. 11, the method further includes: S1001, S1002, and S1003.

In S1001, an RCD sends a broadcast message, wherein the broadcast message includes a proxy resource type identifier.

In this embodiment, the proxy resource type identifier represents an identity of the type of the resource needed by the RCD, which may be a number, a letter or a combination of a number and a letter. As shown in FIG. 11.1, the RCD sends a broadcast message, wherein the broadcast message indicates that the RCD needs to find an NS device having a resource needed by the RCD, and the broadcast message includes the proxy resource type identifier. In the above, the broadcast message may be received by multiple NS devices.

In S1002, the RCD receives second response messages sent by a plurality of NS devices according to the broadcast message.

In this act, as shown in the above FIG. 11.1, a plurality of NS devices that have received the broadcast message sent by the RCD will send second response messages to the RCD, that is, the RCD receives the second response message sent by a plurality of NS devices according to the broadcast message. In the above, the second response message indicates that the NS devices all meet a condition of becoming a proxy device of the RCD. In the above, each NS device sends a second response message to the RCD by unicast.

receiving the broadcast message, the RCD checks whether there is the needed notification message on the notification message list. If there is the needed notification message, the RCD sends to the NS device a request for acquiring the notification message. After receiving the request, the NS device sends the corresponding notification message to the RCD.

According to the method for processing subscription message provided by this embodiment, the RCD receives the second response message sent by each NS device according to the broadcast message, and determines the NS device with the highest priority as the target NS device according to the priority of each NS device carried in the second response message, such that the finally selected target NS device, due to its highest priority, is the best choice of the proxy device for the RCD , which greatly increases the success rate and accuracy of message acquisition of the RCD.

It should be understood that although the acts in the flowcharts of FIGS. 2-11 are shown in sequence as indicated by the arrows, these acts are not necessarily performed in the sequence as indicated by the arrows. Unless explicitly stated herein, the execution of these acts is not strictly limited in the sequence, and these acts may be executed in another sequence. Moreover, at least part of the acts in FIGS. 2-11 may include multiple sub-acts or multiple stages, which may not be necessarily completed at the same time, but may be performed at different times, and the sequence of execution of these sub-acts or stages may not be necessarily performed sequentially, but may be performed alternately with at least part of the sub-acts or stages of other acts, or other acts.

In an embodiment, as shown in FIG. 12, there is provided an apparatus for processing subscription message, which includes a first receiving module 10, a monitoring module 11 and a first sending module 12.

The first receiving module 10 is configured to receive a subscription message wherein the subscription message includes a sending address of a notification message and a subscription resource identifier.

The monitoring module 11 is configured to monitor a target resource corresponding to the subscription resource identifier.

The first sending module 12 is configured to send a notification message to a notification

server (NS) device, which is a notification proxy, according to the sending address of the notification message if the subscription device monitors a change in the target resource, such that the NS device forwards the notification message to a corresponding RCD.

The implementation principle and technical effect of the apparatus for processing subscription message provided by the above embodiment are similar to those in the above method embodiments, which will not be repeated here.

In an embodiment, as shown in FIG. 13, there is provided an apparatus for processing subscription message, which includes a second receiving module 13 and a second sending module 14.

The second receiving module 13 is configured to receive a notification message sent by a subscription device, wherein the notification message is used for indicating a hange in a target resource subscribed by an RCD.

The second sending module 14 is configured to send the notification message to a corresponding RCD.

The implementation principle and technical effect of the apparatus for processing subscription message provided by the above embodiment are similar to those in the above method embodiments, which will not be repeated here.

In an embodiment, as shown in FIG. 14, there is provided an apparatus for processing subscription message, which includes a third sending module 15 and a third receiving module 16.

The third sending module 15 is configured to send a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier.

The third receiving module 16 is configured to receive a notification message sent by an NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change of a target resource corresponding to the subscription resource identifier.

The implementation principle and technical effect of the apparatus for processing

computer program, the processor implements the following acts:

a subscription device receives a subscription message, wherein the subscription message includes a sending address of the notification message and a subscription resource identifier;

the subscription device monitors a target resource corresponding to the subscription resource identifier; and

if the subscription device monitors a change of the target resource, the subscription device sends a notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message, such that the NS device forwards the notification message to a corresponding RCD.

Or,

an NS device receives a notification message sent by a subscription device, wherein the notification message is used for indicating a change of a target resource subscribed by an RCD; and

the NS device sends the notification message to a corresponding RCD.

Or,

an RCD sends a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; and

the RCD receives a notification message sent by an NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change in the target resource corresponding to the subscription resource identifier.

The implementation principle and technical effect of the computer device provided by the above embodiment are similar to those in the above method embodiments, which will not be repeated here.

An embodiment provides a computer readable storage medium on which a computer program is stored, which is executable by a processor to implement the following acts:

a subscription device receives a subscription message, wherein the subscription message includes a sending address of the notification message and a subscription resource identifier;

the subscription device monitors a target resource corresponding to the subscription resource identifier; and

if the subscription device monitors a change of the target resource, the subscription device sends a notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message, such that the NS device forwards the notification message to a corresponding RCD.

Or,

an NS device receives a notification message sent by a subscription device, wherein the notification message is used for indicating a change in a target resource subscribed by an RCD; and

the NS device sends the notification message to a corresponding RCD.

Or,

an RCD sends a subscription message, wherein the subscription message includes a sending address of a notification message and a subscription resource identifier; and

the RCD receives a notification message sent by an NS device corresponding to the sending address of the notification message, wherein the notification message is used for indicating a change of the target resource corresponding to the subscription resource identifier.

The implementation principle and technical effect of the computer readable storage medium provided by the above embodiment are similar to those of the above method embodiment, and will not be described in detail here.

Those of ordinary skill in the art can understand that all or part of the processes of the methods in the above embodiments can be completed by instructing related hardware through a computer program, the computer program may be stored in a non-volatile computer readable storage medium, and during the execution, the computer program can include the processes of the above method embodiments. In the above, any reference to memory, storage, database or other media used in the embodiments provided in the present application can include non-volatile and/or volatile memories. The non- volatile memory may include a Read Only

What is claimed is:

1. A method for processing subscription message, comprising:

receiving, by a subscription device, a subscription message, wherein the subscription message comprises a sending address of a notification message and a subscription resource identifier;

monitoring, by the subscription device, a target resource corresponding to the subscription resource identifier; and

sending, by the subscription device, a notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message if the subscription device monitors a change of the target resource, to enable the NS device to forward the notification message to a corresponding Resource Constrained Device (RCD).

2. The method of claim 1, wherein before monitoring, by the subscription device, the target resource corresponding to the subscription resource identifier, the method further comprises:

identifying, by the subscription device, whether a sending end of the subscription message has an authority of subscribing to the target resource according to a device identifier carried in the subscription message; and

storing, by the subscription device, the subscription message and sending a notification message of subscription completion to the sending end if the sending end has the authority of subscribing to the target resource.

3. The method of claim 1, wherein before monitoring, by the subscription device, the target resource corresponding to the subscription resource identifier, the method further comprises:

storing, by the subscription device, the subscription message and sending a notification message of subscription completion to a sending end of the subscription message if the sending end of the subscription message has an authority of subscribing to the target resource.

4. The method of claim 2 or 3, wherein the sending end is an RCD or an NS device corresponding to the RCD.

5. The method of any one of claims 1 to 4, wherein after sending, by the subscription

device, the notification message to the notification server (NS) device, which is the notification proxy, according to the sending address of the notification message, the method further comprises:

receiving, by the subscription device, a notification response message sent by the NS device.

6. The method of any one of claims 1 to 5, wherein the notification message sent by the subscription device is received by the NS device, and the notification message is used for indicating a change of a target resource subscribed by an RCD.

7. A method for processing subscription message, comprising:

receiving, by a notification server (NS) device, a notification message sent by a subscription device, wherein the notification message is used for indicating a change of a target resource subscribed by a Resource Constrained Device (RCD); and

sending, by the NS device, the notification message to a corresponding RCD.

8. The method of claim 7, wherein before receiving, by the NS device, the notification message sent by the subscription device, the method further comprises:

receiving, by the NS device, the subscription message sent by the RCD, wherein the subscription message comprises a sending address of the notification message and a subscription resource identifier; and

sending, by the NS device, the subscription message to the subscription device.

9. An apparatus for processing subscription message, comprising:

a first receiving module, configured to receive a subscription message, wherein the subscription message comprises a sending address of a notification message and a subscription resource identifier;

a monitoring module, configured to monitor a target resource corresponding to the subscription resource identifier; and

a first sending module, configured to send a notification message to a notification server (NS) device, which is a notification proxy, according to the sending address of the notification message if the subscription device monitors a change of the target resource, to enable the NS

device to forward the notification message to a corresponding Resource Constrained Device (RCD).

10. The apparatus of claim 9, wherein before the target resource corresponding to the subscription resource identifier is monitored,

the monitoring module is further configured to identify whether a sending end of the subscription message has an authority of subscribing to the target resource according to a device identifier carried in the subscription message;

and if the sending end has the authority of subscribing to the target resource, the monitoring module is further configured to store the subscription message, and the first sending module is further configured to send a notification message of subscription completion to the sending end.

11. The apparatus of claim 9, wherein before the target resource corresponding to the subscription resource identifier is monitored, if a sending end of the subscription message has an authority of subscribing to the target resource,

the monitoring module is configured to store the subscription message, and

the first sending module is further configured to send a notification message of subscription completion to the sending end of the subscription message.

12. The apparatus of claim 10 or 11, wherein the sending end is an RCD or an NS device corresponding to the RCD.

13. The apparatus of any one of claims 9 to 12, wherein after the notification message is sent to the notification server (NS) device, which is the notification proxy, according to the sending address of the notification message, the first receiving module is further configured to receive a notification response message sent by the NS device.

14. The apparatus of any one of claims 9 to 13, wherein the notification message sent by the subscription device is received by the NS device, and the notification message is used for indicating a change of a target resource subscribed by an RCD.