Title: METHOD FOR RECEIVING AND TRANSMITTING CUSTOMIZED CONTENT

Abstract: A method for transmitting and receiving a customized content based on a capability of a client. Once a server sends, to a client, a list of contents and information on a capability to operate the contents on the list, the client receives to download a suitable content based on the capability. Accordingly, the client is prevented from receiving a content in the absence of a capability to operate the content.
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METHOD FOR RECEIVING AND TRANSMITTING CUSTOMIZED CONTENT

TECHNICAL FIELD

The present invention relates to a method for transmitting and receiving a content, and more particularly, to a method for transmitting and receiving a customized content based on a capability of a client.

BACKGROUND ART

Generally, in the conventional method for downloading a content through a client, a client has to access a server that provides contents, and then select a content that can be performed by its own capability thus to install the content.

However, a user of the client has a difficulty in discerning which content can be performed (e.g., THEME content for a background screen of the client) among the contents provided by the server. This may cause the user to select and download an undesired content, and thus to pay unnecessary fees. For instance, when the content is for a user interface of the client (e.g., THEME content for a background screen) and consists of a background color, an alphabetical shape, a background size, a background image, etc., there may occur an error that the client receives an undesired content having a font not supported by the client. In this case, the client having received an undesired content has to receive a right content, again.
This may cause network resources to be wasted.

Furthermore, the server has to individually manufacture contents according to a capability of the client.

Besides, when a content corresponds to a user interface of the client, the content can not be real time updated.

**DISCLOSURE OF THE INVENTION**

Therefore, it is a first object of the present invention to provide a method capable of allowing a client to receive, from a server, only a content that can be performed according to a capability of the client.

It is a second object of the present invention to provide a method capable of exchanging information on a capability of a client with a server so as to allow the client to receive, from the server, only a content that can be performed according to the capability of the client.

It is a third object of the present invention to provide a method capable of providing necessary functions to a client and a server such that the client receives, from the server, only a content that can be performed according to a capability of the client.

It is a fourth object of the present invention to provide a method capable of providing processing signals to be exchanged between a client and a server such that the client receives, from the server, only a content that can be performed according to a capability of the client.

According to one aspect of the present invention, there is provided a
method capable of allowing a client to receive, from a server, only a content that can be performed according to a capability of the client, by exchanging information on its capability with the server.

According to another aspect of the present invention, there is provided a protocol to exchange information on a capability of a client with a server.

According to still another aspect of the present invention, there is provided a function unit configured to provide information on a capability of a client to a server, and a receiving unit configured to receive only a content that can be performed by the client.

In the present invention, a server requests information on a capability of a client to receive the information from the client, and provides a content corresponding to the capability to the client. Alternatively, once the server sends, to the client, a list of contents and information on a capability to perform the contents on the list, the client receives to download a suitable content based on the capability.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided a method for receiving a customized content, comprising: receiving, from a server, a list of contents and a capability required to perform the contents on the list; comparing the received capability with its own capability; and requesting the content from the server when it is determined that the client is able to perform a content on the list by its own capability as a result of the comparison.
According to another aspect of the present invention, there is provided a method for providing a customized content, comprising: receiving a capability advertisement message including information on a capability of a client; checking the capability of the client included in the capability advertisement message; receiving a content request message from the client; updating a pre-stored content in correspondence to the capability of the client based on the received content request message; and providing the updated content to the client.

In the present invention, since the client is configured to receive only a content that can be performed by its capability, fees charged to a user can be reduced. Furthermore, since a right content is sent to the client at one time, waste of network resources can be reduced.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a block diagram showing a client and a server according to the present invention;

FIG. 2 is a flowchart showing a content receiving method according to a first embodiment of the present invention;

FIG. 3 is a flowchart showing a content receiving method according to a second embodiment of the present invention; and

FIGs. 4 to 6 are an exemplary view showing values included in a message used to exchange information on a capability of a client.
MODES FOR CARRYING OUT THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

Hereinafter, a method for transmitting and receiving a customized content will be explained in more detail with reference to the attached drawings.

FIG. 1 is a block diagram showing a client and a server according to the present invention.

Referring to FIG. 1, a client according to the present invention comprises a User Management/Capability Management Unit 110.

More concretely, the client 100 of the present invention comprises a User Management/Capability Management Unit 110, a Download/Installation Unit 120, a Management Object (MO) Set/Management Unit 130, and a Status Reporter 140.

The User Management/Capability Management Unit 110 performs a user management function, and a capability management function. The user management function allows a user to subscribe to a specific service, e.g., a user interface change service of the client, such as a content providing service or a Lock & Feel customization (LFC) service. And, the capability management function manages a capability of the client by checking whether the client is capable of performing a specific content before the client receives the specific content, and then to provide the capability to a server 200 if
The Download/Installation Unit 120 performs a download function, and an installation function. The download function is executed by receiving a content from the server 200 based on a communication standard such as OMA DLOTA and OMA DM. The download function is executed by reporting or ignoring an error occurring while receiving a content, to the server 200. The installation function by the Download/Installation Unit 210 is executed by installing a downloaded content, and by sending, to the Status Reporter 140, a response to completion of the installation. The installation function may be executed by performing other functions rather than the installation.

The MO Set/Management Unit 130 manages information on the content, or information on the client, as a Management Object (MO). Here, the MO Set/Management Unit 130 may manage the MO in the form of a tree. The MO Set/Management Unit 130 may connect a session to the server 200 thereby to receive a plurality of indications from the server 200. For instance, the MO Set/Management Unit 130 may receive indications such as sending, installation, removal, update, activation, and deactivation of the content, or an indication such as authentication changes of the content. The MO Set/Management Unit 130 may include the User Management/Capability Management Unit 110 and the Download/Installation Unit 210, or may be individually implemented therefrom.

The Status Reporter 140 reports, to the server 200, a status of the client 100 such as whether the content has been successfully received, and
whether the content has been successfully installed. The Status Reporter 140 may be connected to the MO Set/Management Unit 130 thereby to report many statuses of the MO to the server 200.

Although not shown, the client 100 may further comprise a content protection unit. The content protection unit serves to safely download the content, to safely perform the content inside the client 100, and not to leak the content to outside. The content protection unit protects the content from undesirably corrected or performed. The content protection unit may be based on a standard of OMA DRM.

As shown in FIG. 1, the server 200 includes a User Management/Capability Management Unit 210, a Transmitting Unit 220, a Remote Controller 230, and a Status Receiver 240.

As aforementioned, the User Management/Capability Management Unit 210 performs a user management function, and a capability management function. The user management function is implemented by processing subscription request of the client to a specific service, e.g., an interface change service of the client, such as a content providing service or a Lock & Feel customization (LFC) service. Also, the User Management function processes not only starting of the service, but also providing of a service. For instance, when a user subscribes to the LFC service and requests a specific LFC package, the User/Management function is implemented by managing the LFC package and charging. The subscription may be achieved in a various manner, e.g., on a web service or through a
content purchase request. The charging may be also achieved in a various manner.

The transmitting unit 220 sends, to the client 100, a content requested by the client 100. Here, when reconfiguration of a pre-stored content is necessary, the transmitting unit 220 reconfigures the content based on a capability of the client.

The remote controller 230 may perform an indication to the client 100. For instance, the remote controller 230 may send, to the client 100, indications such as sending, installation, removal, update, activation, and deactivation of the content, or an indication such as authentication changes of the content. The remote controller 230 may be divided into two parts, e.g., a sending unit and a managing unit. The sensing unit serves to send a message for remote management, and the managing unit serves to manage the client 100 based on a standard such as OMA DM.

The Status/Receiver 240 receives a status report from the client 100, and processes the status report.

Hereinafter, operations of the client 100 and the server 200 will be explained.

FIG. 2 is a flowchart showing a content receiving method according to a first embodiment of the present invention, and FIGs. 4 to 6 are an exemplary view showing values included in a message used to exchange information on a capability of a client.

Referring to FIG. 2, in a content receiving method according to a first
embodiment of the present invention, once information on a capability of the client 100 is provided to the server 200, the server 200 updates a pre-stored content such that the client 100 can perform the pre-stored content. Then, the server 200 provides the pre-stored content to the client 100, which will be explained in more detail.

(1) The User Management/Capability Management Unit 210 of the server 200 informs the client 100 of the service through a 'network initiated ad' message (S101). The advertisement may be optionally performed. That is, the server 200 may or may not advertise the service.

(2) The User Management/Capability Management Unit 110 of the client 100 sends, to the server 200, a message requesting subscription to the service, e.g., a Subscription Request message (S102).

(3) The User Management/Capability Management Unit 210 of the server 200 sends, to the client 100, a message responding to the Subscription Request message, e.g., a Subscription Response message (S103).

(4) The User Management/Capability Management Unit 110 of the client 100 sends, to the server 200, information on a capability of the client 100. Here, the information on a capability of the client 100 may be sent with being included in a capability advertisement message, e.g., an 'Advertisement of Client Capability' message. The Advertisement of Client Capability message consists of values shown in FIG. 4. More concretely, the Advertisement of Client Capability includes at least one of OmaLFC,
OmaLFCVersion, OmaLFPackage, Supported, OmaLFCDeliveryMethods, OmaLFCModel, OmaLFCRemovalMedia, OmaLFCAuth, OmaLFCCasheSize, OmaLFCcurrentFontSize, OmaLFCcurrentActivepart, OmaLFCSupportedArea, OmaLFCaudioformat, OmaLFCvideoformat, OmaLFCpictureformat, and OmaLFCCPreference.

(5) The User Management/Capability Management Unit 210 of the server 200 receives a message, and checks information on a capability of the client 100 (S1 05).

(6) The User Management/Capability Management Unit 110 of the client 100 sends, to the server 200, a message to request a content, e.g., a 'Content Request' message (S106).

(7) Once receiving the 'Content Request' message, the User Management/Capability Management Unit 210 of the server 200 sends, to the transmitting unit 220, a message requesting sending, e.g., the 'Content Request' message (S107).

(8) The transmitting unit 220 of the server 200, sends, to the User Management/Capability Management Unit 210 of the server 200, a message to request information on a capability of the client 100, e.g., a 'client capability list request' message (S108).

(9) The User Management/Capability Management Unit 210 of the server 200 sends, to the transmitting unit 220, a message including information on a capability of the client 100, e.g., a 'client capability list response' message (S109).
The transmitting unit 220 checks capability information of the client 100, and when a pre-stored content can not be operated by a capability of the client 100, the transmitting unit 220 updates the pre-stored content in correspondence to the capability of the client (S110).

The transmitting unit 220 of the server 200 sends the content to the client 100 (S111). Once the Download/Installation Unit 210 of the client 100 has successfully completed downloading of the content, a message indicating completion of the downloading, e.g., 'Confirmation of download' message is sent to the Status Reporter 140 (S112). Then, the Status Reporter 140 sends, to the server 200, a message indicating completion of the downloading, e.g., 'Download Completion' message (S113).

Then, the Download/Installation Unit 210 installs the received content (S114). Upon completion of installation of the received content, the Download/Installation Unit 210 sends, to the Status Reporter 140, a message indicating that the received content has been successfully installed, e.g., a 'Confirmation of Installation' message (S115). Then, the Status Reporter 140 sends, to the server 200, the 'Confirmation of installation' message so as to inform a successful downloading (S116).

The MO Set/Management Unit 130 of the client 100 may manage information on a capability of the client 100 as a management object (MO). Here, the MO Set/Management Unit 130 may manage the MO about the information in the form of a tree. To this end, the MO Set/Management Unit 130 maps the information on a capability of the client onto a tree as an
MO, together with the User Management/Capability Management Unit 110 (S1 17).

(18) The MO Set/Management Unit 130 of the client may manage information on a content received by the client 100 as an MO. To this end, the MO Set/Management Unit 130 maps the information on the content onto a tree as an MO, together with the User Management/Capability Management Unit 110 (S1 18).

(19) Once the capability information and the content information are mapped onto a tree as an MO, the Remote Controller 230 of the server 200 may manage the client 100 through the tree.

FIG. 3 is a flowchart showing a content receiving method according to a second embodiment of the present invention. Referring to FIG. 3, once the server 200 sends, to the client 100, a list of contents, and information on a capability of the client required to operate the contents on the list, the client 100 can receive to download a suitable content based on the information on a capability of the client 100. This will be explained in more detail.

(1-3) Procedures of S201-S203 are same as those of S101-S103.

(4) The User Management/Capability Management Unit 110 of the client 100 sends, to the server 200, a message requesting a list of contents possessed by the server 220, and information on a capability requested to operate the contents on the list, e.g., a 'Content List Request with Capability Description' message (S204).

(5) In response to the 'Content List Request with Capability
Description' message, the User Management/Capability Management Unit 210 of the server 200 sends, to the client 100, a message including a list of contents possessed by the server 200, and information on a capability requested to operate the contents on the list, e.g., a 'Content List Response with Capability Description' message (S205).

(6-9) Once receiving the message, the User Management/Capability Management Unit 110 of the client 100 checks its own capability and a capability necessary to operate the contents on the list (S206). Then, the User Management/Capability Management Unit 110 sends, to the Status Reporter 140, a message indicating that the capability has been completely checked, e.g., a 'Capability Check Notification' message (S207). The Status Reporter 140 sends, to the server 200, the 'Capability Check Notification' message (S208). Then, the Status Receiver 240 of the server 200 receives the 'Capability check Notification' message, and sends it to the User Management/Capability Management Unit 210 (S209).

(10) The User Management/Capability Management Unit 110 of the client 100 sends, to the server 200, a message requesting a content having been determined, as a result of the comparison, as a content that can be operated among the contents on the list, e.g., a 'Content Request' message (S210).

(11-13) In response to the 'Content Request' message, the User Management/Capability Management Unit 210 of the server 200 checks capability information of the client 100. Then, when a pre-stored content can

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not be operated by a capability of the client 100, the User Management/Capability Management Unit 210 of the server 200 updates the pre-stored content in correspondence to the capability of the client 200 (S211). And, the User Management/Capability Management Unit 210 of the server 200 sends, to the transmitting unit 220, a message requesting sending of the content, e.g., a 'Content Request' message (S212). Then, the transmitting unit 220 sends the content to the client 100.

(14-15) Once the Download/Installation Unit 210 of the client 100 has completed downloading of the content, a message indicating a successful downloading, e.g., a 'Confirmation of Download' message is sent to the Status Reporter 140 (S214). Then, the Status Reporter 140 sends, to the server 200, a 'Download Completion' message so as to inform a successful downloading (S215).

(16-18) As aforementioned, the MO Set/Management Unit 130 of the client 100 maps information on a capability of the client 100 onto a tree as an MO, together with the User Management/Capability Management Unit 110 (S216), thereby managing the information on a capability of the client 100 as an MO. Furthermore, the MO Set/Management Unit 130 of the client 100 maps information on the content onto a tree as an MO, together with the User Management/Capability Management Unit 110 (S217), thereby managing information on a content received by the client 100 as an MO. Once the capability information and the content information are mapped onto a tree as an MO, the Remote Controller 230 of the server 200 can manage the client
100 through the tree (S218).

In addition, the above various embodiments may be implemented by software, hardware or some combination thereof. For instance, the method according to the present invention may be implemented in a storage medium (e.g., memory inside a mobile device, flash memory, hard disc, etc.), or may be implemented in codes or commands inside a software program that can be executed by a processor (e.g., microprocessor inside a mobile device).

It will also be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.
CLAIMS

1. A method for receiving a content, comprising:
   receiving, from a server, a list of contents and a capability required to
   perform the contents on the list;
   comparing the received capability with its own capability; and
   requesting the content from the server when it is determined that the
   client is able to perform a content on the list by its own capability as a result of
   the comparison.

2. The method of claim 1, further comprising requesting, from the
   server, the content list and a capability of the client required to perform the
   contents on the list.

3. The method of claim 1, further comprising sending, to the server,
   a capability check completion message after comparing the received
   capability with its own capability.

4. The method of claim 1, further comprising:
   receiving, from the server, an 'advertisement message about a
   content providing service;
   sending, to the server, a subscription request message; and
   receiving, from the server, a response message to the subscription
   request message.
5. The method of claim 1, further comprising:
   mapping information on its own capability onto a DM(Device Management) Tree;
   mapping information on the received content onto the DM Tree; and
   receiving management from the server through the DM Tree.

6. A method for providing a content, comprising:
   receiving a capability advertisement message including information
   on a capability of a client;
   checking the capability of the client included in the capability
   advertisement message;
   receiving a content request message from the client;
   updating a pre-stored content in correspondence to the capability of
   the client based on the received content request message; and
   providing the updated content to the client.

7. The method of claim 6, further comprising:
   receiving, from the client, a download completion message about the
   content; and
   receiving, from the client, an installation completion message about
   the content.

8. The method of claim 6, further comprising:
receiving, from the client, a subscription request message; and
sending, to the client, a response message to the subscription request message.
FIG. 2

- Network initiated ad (S101)
- Subscription request (S102)
- Subscription response (S103)
- Advertisement of client capability (S104)
- Content request (S106)
- Content Delivery (S111)
- Conformation of download (S112)
- Download completion (S113)
- Content installation (S114)
- Confirmation of installation (S115)
- Confirmation of installation (S116)
- MO tree mapping (S117)
- Management using DM tree (S119)
FIG. 3

Network initiated ad (S201)

Subscription request (S202)

Subscription response (S203)

Content list Request with Capability Description (S204)

Content list Response with Capability Description (S205)

Capability Check (S206)

Capability checks notification (S207)

Capability checks notification (OK) (S208)

Content request (S210)

Notification of OK (S209)

Content Reconfiguration (S211)

Content request (S212)

Content Delivery (S213)

Conformation of download (S214)

Download completion (S215)

MO tree mapping (S216)

MO tree mapping (S217)

Management using DM tree (S218)
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>Resolution Rule</th>
<th>Type</th>
<th>Sample Values</th>
<th>MUST Advertised</th>
</tr>
</thead>
<tbody>
<tr>
<td>OmaLFC</td>
<td>Sent &quot;Yes&quot; if the device supports LFC enabler.</td>
<td>Locked</td>
<td>Boolean</td>
<td>&quot;Yes&quot;, &quot;No&quot;</td>
<td>The LFC Client MUST send the &quot;Yes&quot; or &quot;No&quot;.</td>
</tr>
<tr>
<td>OmaLFCVersion</td>
<td>Supported LFC Enabler. Release version in &quot;&lt;major&gt;;&lt;minor&gt;&quot; format supported by the LFC Client.</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;1.0&quot;</td>
<td>The LFC Client MUST send the supported version. If the LFC Client supports multiple versions, it MAY send multiple supported versions.</td>
</tr>
<tr>
<td>OmaLFCPackagedSupported</td>
<td>Number of supported LFC Packages. The LFC Client MUST support at least one LFC Package.</td>
<td>Locked</td>
<td>Literal</td>
<td>&quot;1&quot;, &quot;10&quot;</td>
<td>The LFC Client MUST send the value if it supports multiple LFC Packages.</td>
</tr>
<tr>
<td>OmaLFCDeliveryMethods</td>
<td>Supported delivery methods or protocol for LFC Packages</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;DLOTA&quot;, &quot;DM&quot;</td>
<td>The LFC Client MUST send the value if it supports the specific LFC delivery mechanism.</td>
</tr>
<tr>
<td>OmaLFCModel</td>
<td>Supported LFC Models among three ones: (1) lightweight, (2) network-triggered, (3) remote management.</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;1&quot;, &quot;2&quot;, &quot;1 &amp; 2&quot;</td>
<td>The LFC Client Must send the supported models. It can cover whole model types.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Description</td>
<td>Resolution Rule</td>
<td>Type</td>
<td>Sample Values</td>
<td>MUST Advertised</td>
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</tr>
<tr>
<td>OmaLFCRemovalMedia</td>
<td>Sent 'Yes' if the removal media is possible to use for LFC Service</td>
<td>Override</td>
<td>Boolean</td>
<td>&quot;Yes&quot;, &quot;No&quot;</td>
<td>The LFC Client MUST send the &quot;Yes&quot; or &quot;No&quot;.</td>
</tr>
<tr>
<td>OmaLFCAuth</td>
<td>Supported LFC Authentication methods.</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;</td>
<td>The LFC Client MUST send the supported Authenticated methods. Like 'RSS-PSS', etc.</td>
</tr>
<tr>
<td>[DPE] OmaLFCCache Size</td>
<td>LFC-reserved content cache memory size in bytes</td>
<td>Override</td>
<td>Literal</td>
<td>&quot;300&quot;</td>
<td>The LFC Client MUST send the possible cache size for the LFC services as designed or indicate the current cache size (through DPE enabler.)</td>
</tr>
<tr>
<td>OmaLFCcurrentFontSize</td>
<td>Used font size for LFC Elements</td>
<td>Override</td>
<td>Literal</td>
<td>&quot;8&quot;, &quot;10&quot;</td>
<td>The LFC Client MUST send the current font size in the browser.</td>
</tr>
<tr>
<td>Attribute</td>
<td>Description</td>
<td>Resolution Rule</td>
<td>Type</td>
<td>Sample Values</td>
<td>MUST Advertised</td>
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<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>[UAProf or DPE] OmaLFCSupportedArea</td>
<td>Supported areas which are applicable of LFC contents (it can be updated as adding/deleting application services)</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;indicator&quot;, &quot;background&quot;, &quot;application_name&quot;, etc</td>
<td>The LFC Client MUST send the LFC content applicable area list.</td>
</tr>
<tr>
<td>OmaLFCaudioformat</td>
<td>Supported audio format for LFC Packages</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;mp3&quot;..</td>
<td>The LFC Client MUST send the supported audio format of LFC elements.</td>
</tr>
<tr>
<td>OmaLFCvideoformat</td>
<td>Supported video format for LFC Packages</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;avi&quot;..</td>
<td>The LFC Client MUST send the supported video format of LFC elements.</td>
</tr>
<tr>
<td>OmaLFCpictureformat</td>
<td>Supported picture format for LFC Packages</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;jpeg&quot;, &quot;gif&quot;</td>
<td>The LFC Client MUST send the supported picture format of LFC elements.</td>
</tr>
<tr>
<td>[DPE] OmaLFCPreference</td>
<td>Supported LFC Client preference profile based on various subscribed types.</td>
<td>Append</td>
<td>Literal</td>
<td>&quot;weather&quot;, &quot;time&quot;..</td>
<td>The LFC Client MUST send the subscribed user preference profile list.</td>
</tr>
</tbody>
</table>