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(54) **Title**: DIGITAL CUSTOM DATA CONTENT INJECTION MECHANISM FOR A CONTENT DELIVERY NETWORK

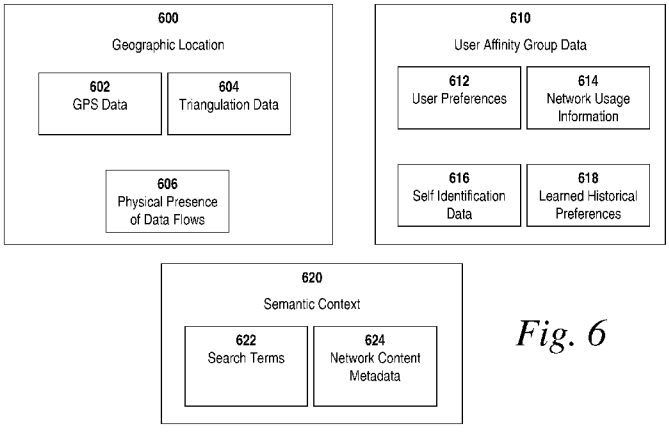

Fig. 6

(57) **Abstract**: A content selection and injection mechanism is provided for a communication network. In the communication network, an electronic device inserts custom data content into a data stream. The electronic device accepts a data stream from a location in the access network and identifies an insertion point suitable for inserting the custom data content into the data stream. The electronic device also selects the custom data content from a local content storage repository located in the access network, and inserts the custom data content into the data stream at the identified insertion point. The electronic device may identify a targeted user for receiving content, and select the custom data content based on the identity of the targeted user.

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DIGITAL CUSTOM DATA CONTENT INJECTION MECHANISM FOR A CONTENT DELIVERY NETWORK

CROSS REFERENCE TO RELATED APPLICATIONS

This application is related and claims priority to U.S. application serial No. 12/200304 filed Aug 28, 2008. The entire content of the foregoing application is incorporated herein by this reference.

BACKGROUND

A communication network typically includes a core network and at least one access network. The core network is the central part of the communication network and serves as the backbone of the communication network. The core network typically includes high capacity switches and transmission equipment. Each access network serves as the point of contact with the communication network for users. Access networks connect subscribers with their service providers. A communication network may have multiple access networks, serving different sets of users, in communication with a single core network.

A communication network may deliver content to a user. Typically, a user device in an access network will create a request for a certain piece of content, and forward that request through the access network to the core network. A core services platform, which is a device located in the core network that performs a variety of services, may identify a location where the requested content is stored. Typically, this location is a content storage repository. The content storage repository may be located in the same access network as the user, in a different access network, or in the core network. The core services platform then may coordinate the retrieval of the requested content from the content storage repository, and may coordinate the delivery of the requested content back to the user device.

One additional use for communication networks is the delivery of custom content, such as advertising, to a user. When a user device requests content, further

custom content is sent to the user device in addition to the requested content. This custom content may be stored in the core network or an access network. The custom content may or may not reside in the same content storage repository as the requested content. Locating and coordinating the delivery of this custom content is a task also typically performed by the core network.

This additional functionality increases the burden on the core network. Even if not stored in the core network, the content will likely need to pass through the core network on its way to the user, requiring increased bandwidth through the core. Further, users (and custom content providers) increasingly make use of interactive and streaming data, which increases the amount of data that must be stored and moved through the network in comparison to static or non-streaming data. This can be a drain on the resources of the core network. When the core network experiences heavy traffic, this can be reflected in less data throughput in each of the access networks serviced by the core, even when only one of the access networks is responsible for the increased traffic.

SUMMARY

According to the present disclosure, a content selection and injection mechanism is provided for a communication network. In the communication network, for example, a wireless content delivery network, an electronic device inserts custom data content into a data stream. The electronic device may accept a data stream from a location in the access network and identify an insertion point suitable for inserting the custom data content into the data stream. The electronic device may also select the custom data content from a local content storage repository located in the access network, and insert the custom data content into the data stream at the identified insertion point. To facilitate custom data content insertion, the data stream may contain a placeholder object that the inserted custom data content modifies or replaces.

According to one embodiment, the electronic device may identify a targeted user for receiving content, and select the custom data content based on the identity of the targeted user. For example, the custom data content may be selected based on an affinity group of the targeted user which defines preference data for the targeted user.

The content object may also be selected based on a learned historical preference of the targeted user.

According to another embodiment, the custom data content may be selected based on the geographic location of the targeted user. If the targeted user changes geographic location, the electronic device may select additional custom data content, identify a second insertion point suitable for inserting the additional custom data content into the data stream, and insert the additional custom data content object into the data stream at the second insertion point.

According to another embodiment, the data stream may be analyzed for semantic context information, and the custom data content may be selected based on the semantic context information.

The above-mentioned content selection schemes may be applied alone or in combination.

The data stream may be a media stream containing streaming video or audio. In this case, the insertion point may be a video or audio transition that defines a scene change or media object cache segment changeover. Alternatively, the insertion point may be a streaming media state change that updates a state of the media stream.

A method of inserting custom data content into a data stream, and an electronic device readable storage medium storing executable instructions for inserting custom data content into a data stream are also provided.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts a communication network suitable for practicing the embodiments described herein.

FIG. 2 depicts an access network suitable for practicing the embodiments described herein.

FIG. 3 depicts an electronic device suitable for practicing the embodiments described herein.

FIG. 4 depicts an example of a data stream containing streaming video.

FIG. 5 depicts a flow chart of one embodiment of the procedures performed by the electronic device of FIG. 3.

FIG. 6 depicts data selection metrics for use in an illustrative embodiment.

DETAILED DESCRIPTION

In view of the limited resources available in a core network, it may be beneficial to move some functionality away from the core and into the access network. Because the access network is typically located in close geographic proximity to the user, targeted data content can be provided to users in an efficient manner by utilizing the access network. Further, resources can be apportioned in the access network without diminishing the functionality of the core network. As a result, a spike in resource usage in the access network will not necessarily slow the entire core network, and, by extension, the other access networks.

Therefore, there is a need for a content selection mechanism with the capability to identify a targeted user, and select data content stored locally in the access network to be injected in user data stream. This data content may be aligned with stated individual or affinity-group preferences, semantically identified based on user data consumption elements and patterns, or selected based on the geographic location of the targeted user. Alternatively, a combination of these capabilities can be applied given the local availability and relative priority of selected data content objects.

There is also a need for a content injection mechanism located in the access network. The content injection mechanism should have the capability to identify an

insertion point in a data or media stream, and insert data content in an appropriate manner.

FIG. 1 depicts a communication network **100**. According to one embodiment, the communication network **100** may be a wireless network, such as a mobile telecommunication network, and includes a core network **110** and access networks **150**, **152** and **154**. According to other embodiments, the communication network **100** may include more or fewer access networks. One skilled in the art will recognize that the functionality described herein example is equally applicable in different types of communication networks, such as a network utilizing a WiFi framework, a UTRAN or UMTS framework, a CDMA framework, a WiMax framework, or a UMB framework, among others.

Within the core network **110** may be any number of core services platforms **112**, such as servers. The core services platforms **112** may provide services within the core network, such as (but not limited to) fetching data from a storage repository **114** and routing data throughout the communications network **100**, and may provide an interface to back-end infrastructure (such as file servers, DNS routers, etc) to support the operation of the network **100**. A cores services platform **112** can take a number of forms, depending on the services to be provided. For example, if the core services platform **112** is tasked with routing data, the core services platform **112** may be a switch or a router. If the core services platform **112** must store data, the core services platform **112** may be a server, such as a file server or a mail server. Other core services platforms include network bridges, network hubs, and repeaters.

The storage repository **114** may be located within the core network **110**, or alternately may be located in an access network. The storage repository **114** may be a file server, though it may be another type of device capable of storing content, such as a personal computer.

A user **158** using a user device **160** typically interacts with an access network **150** via a communications device, such as a modem, fiber optic connection, or a transmitter and receiver for radio communication. The user device **160** may be, for

example, but is not limited to, a laptop, a cellular phone, or a Global Positioning System device. The user device **160** will typically send and receive data through a base station **190** located in the access network **150**. The base station **190** may be, for example, a gateway, a cell tower, a Node B, or an Enhanced Node B.

The base station may itself interact with one or more intermediate service platforms **180** located in the access network **150**, or may interact directly with the core network **110**. The intermediate service platforms **180** may perform tasks such as resource management, filtering, and routing. Examples of intermediate service platforms **180** include Radio Network Controllers, bridges, and routers.

When the user **158** using the user device **160** requests data, the core network may locate the requested data in a storage repository **114**. Storage repository **114** may be in the user device's access network **150**, or the core network **110**, or in a different access network **152**. Once the storage repository **114** is located, the data may be sent back to the user device **160**, potentially after being routed through the core network **110**.

A content provider may wish to provide custom data content to the user device **160**. For example, a business owner may wish to provide advertising. Conventionally, this custom data content might be stored on a storage repository located in an access network **150** local to the user **158**, in a non-local access network **152**, or even potentially in the core network **110**. Although the custom data content may be stored in the local access network **150**, the local proximity of the requested custom data content may be unknown when it is requested. Thus, the custom data content will typically be routed through the core network **110**, even if it is stored at a location near the user **158**. The location and routing of the custom data content is typically performed by a core services platform **112**.

An advertiser may not have information relating to the user **158**. The advertiser may not know where the user is located, and may lack other information that would be useful to provide targeted, personalized advertising. Information about the user **158** may not be stored in the network; alternatively, information about the user **158** may be stored in the core network **110**. Because the core network **110** must store and process

information about all of the users in each access network, only a limited amount of core network resources may be dedicated to this user analysis.

FIG. 2 depicts an access network **150** suitable for practicing the embodiments described herein. Access network **150** is the part of the communication network **100** in which a user device **160** is located. Each access network serves as the point of contact with the communication network for users, and connect subscribers with their service providers. A communication network may have multiple access networks, serving different sets of users, in communication with a single core network. Examples of access networks include the UMTS Terrestrial Radio Access Network (UTRAN), the GSM Radio Access Network (GRAN), and the GSM Edge Radio Access Network (GERAN).

In the access network **150**, an electronic device **170** inserts custom data content into a data stream. As will be discussed in more detail below, the electronic device **170** may serve as both a content selection mechanism and a content injection mechanism. Alternatively, these responsibilities may be split into two or more separate electronic devices. Electronic device **170** may be, for example, a server or a router, or may be a custom-designed device.

The electronic device may select custom data content **450** (depicted in **FIG. 4**) from a local content storage repository **114** located in the local access network **150**. The storage repository may contain a variety of custom data content **450** (depicted in **FIG. 4**) for insertion into the data stream. The storage repository **114** and the electronic device **170** may be the same device, or they may be two different devices.

More than one custom data content object may be selected for delivery to user. In this case, content injection priority may be determined either by the electronic device **170**, or by the user's local system configuration. The content selection mechanism will be discussed in more detail below.

FIG. 3 depicts an example of an electronic device **170** suitable for practicing the embodiments described herein. As noted above, the electronic device **170** may be, for

example, a server or a router, or may be a custom-designed device. The electronic device **170** may contain a storage **310** for storing instructions **312** to be executed by a processor **320**. The storage **310** may be any type of recording media, such as RAM, ROM, magnetic storage, or optical storage. The storage **310** may also store an operating system **314** for operating the electronic device **170**. The storage **310** may store additional applications **316** for providing additional functionality.

The electronic device **170** may have a communication device **330** for communicating with a communication network **100**. The communication device **330** may be, for example, a modem, an Ethernet connection, a fiber optic connection, a radio antenna, or any suitable means for communicating with a network.

The electronic device **170** may proxy a transport protocol in the access network **150**. For example, if the network is a UMTS network, the electronic device **170** may proxy an Iu-B or an Iu-PS protocol. However, the present disclosure is not limited to implementation in a UMTS network, and may be deployed in any suitable communication network. The transport protocol employed will vary based on the type of communication network utilized.

FIG. 4 depicts an exemplary data stream **400**, which may be routed through the communication network **100**. In addition to serving as a content selection mechanism, the electronic device **170** may also function as a content injection mechanism. In this capacity, the electronic device **170** accepts the data stream **400** at a location in the access network **150**. The electronic device **170** identifies an insertion point **410** suitable for inserting the custom data content **450** into the data stream **400**, and inserts the custom data content **450** into the data stream **400** at the identified insertion point **410**. This content-injection mechanism will be discussed in more detail below.

To facilitate custom data content insertion, the data stream may contain a placeholder object **420** that the inserted custom data content modifies or replaces. This allows custom data content to substitute for non-custom data content. However, such a placeholder is not a requirement, and the electronic device **170** may insert custom data

content into a data stream at an insertion point containing existing non-placeholder media, or no media at all. This allows data content to be added to a data stream.

The data stream **400** may be a media stream containing streaming video or audio, and may be consistent with endpoint session media descriptors. The media stream may utilize a media transport mechanism such as RTP, RTSP, or HTTP. Depending on the type of media stream, other media transport mechanisms may be utilized.

If the data stream is a media stream, the insertion point **410** may be a video or audio transition that defines a scene change or media object cache segment changeover. The electronic device **170** may identify a scene change or media object cache segment changeover in the media stream by analyzing the media stream and determining when such a change takes place. Alternately, the media stream or another device may indicate when such a change occurs.

Alternatively, the insertion point **410** may be a streaming media state change that updates a state of the media stream. For example, if the user **158** is watching streaming video on the user device **160**, and subsequently presses the "stop," "pause," or "play" button, this may indicate a change in the state of the media stream. At this point, the electronic device **170** may identify this point in the media stream as an insertion point **410** and may insert custom data content **450** at the insertion point **410**.

The data stream **400** may also contain structured format data objects, such as HTML pages. In this case, the electronic device **170** may insert custom data content **450** within the structured format data objects dynamically. Alternatively, if the data stream contains structured text object elements, the electronic device may insert the custom data content **450** as defined within the structured text object elements statically.

FIG. 5 depicts a flowchart of procedures that may be carried out by electronic device **170**. According to one embodiment, the storage **310** of electronic device **170** may store executable instructions **312** for inserting custom data content **450** into a data stream **400** in the communication network **100** (see **FIG. 4**). At step **510**, the instructions **312** may cause the processor **320** to accept a data stream **400** from a location

in the access network **150**. Step **510** may involve intercepting a data stream **400** present in the access network **150**, where the data stream **400** is bound for location in the access network **150** or the core network **110**. For example, electronic device **170** may intercept a data stream **400** destined for user device **158,** after data stream **400** was sent from a core services platform **112**. Alternatively, step **510** may simply involve receiving a data stream **400** which has been routed specifically to electronic device **170**.

At step **520**, the instructions **312** cause the processor **320** to identify an insertion point **410** suitable for inserting the custom data content **450** into the data stream **400**.

At step **530**, the instructions **312** cause the processor **320** to select the custom data content **450** from a local content storage repository **114** located in the access network **150**, and at step **540**, the instructions **312** cause the processor **320** to insert the custom data content **450** into the data stream **410** at the identified insertion point. After the custom data content **450** has been inserted into the data stream **410**, the data stream becomes a custom data stream. At step **550**, the custom data stream, including the custom data content **450**, may be forwarded to a user.

According to one embodiment, the electronic device **170** may, at step **525**, identify a user **158** (a "targeted user") for receiving content. If a user **158** is identified, the electronic device **170** may, at step **530**, select the custom data content **450** based on the data selection metrics relating to the identity of the user **158**. **FIG. 6** depicts several data selection metrics. For example, the custom data content **450** may be selected based on an affinity group **610** of the targeted user **158**. An affinity group **610** defines preference data for the user **158**. For example, one user might have an affinity group of "boating enthusiast," and might be served custom data content related to boating, yachting, or watersports. A user **158** may belong to one or more affinity groups.

Affinity group data may be obtained and stored at the electronic device **170**, or either of these functions may be carried out by a different device. User affinity groups may be determined by analyzing user preferences **612** and network usage information **614**, or the user may self-identify **616** with certain affinity groups. Affinity group data may be well-defined and structured to enable a strong and unambiguous association with

locally deployed custom data content. Injected content metadata **460** may identify a classification that provides an association with user- and affinity-group preferences. Injected content may have multiple classifications to provide better or broader coverage. Delivery metrics may be obtained for each user to provide history and custom data content selection refinement based on what custom data content proves to be of interest to a user. In this way, the custom data content **450** may be selected based on a learned historical preference **618** of the targeted user.

As an alternative or a supplement to affinity group data, the custom data content **450** may be selected based on the geographic location **600** of the targeted user. Such a geographic location may be determined by a number of means, such as the Global Positioning System data **602**, or triangulation **604** based on the signal strength of the user device **160**. Geographic location may also be determined by the physical presence of data flows **606** in an access network. Local substitution may be performed by the electronic device **170**. Thus, a mobile or stationary user may receive targeted custom data content relating to the geographic area that they are in. If custom data content is not available for the local area, a default selection may be made from an upstream origin source to provide non-geographic default content.

If the targeted user changes geographic location, the electronic device **170** may select additional custom data content **455**, identify a second insertion point **415** suitable for inserting the additional custom data content **455** into the data stream **400**, and insert the additional custom data content **455** into the data stream **400** at the second insertion point **415**. The second insertion point could be the same as, or different than, the first insertion point. In this way, as a mobile user traverses between different locations in the same access network, or different access networks, injected content sent into the user's data flow may change as different local references are selected.

The data stream **400** may also be analyzed for semantic context information **620**, and the custom data content may be selected based, totally or in part, on the semantic context information. Semantic context information **620** might include a number of data points, such as search terms **622** or network content metadata **624**. This analysis may allow the electronic device **170** to provide context-driven custom data content. A

mapping of custom data content classifications to broad context definitions may enable a coupling of user experience to selected custom data content. Additional granularity in the semantic context classification mapping may result in more targeted custom data content selection.

Because electronic device **170** is located in the access network **150**, rather than the core network **110**, custom data content can be provided at a location closer to a user **158**. Further, resources at the network core **110** are freed to perform other tasks. With the systems and methods described herein, more information can be collected and stored about a user **158**, thus resulting in a better selection of customized data content.

Numerous modifications and alternative embodiments of the present invention will be apparent to those skilled in the art in view of the foregoing description. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the best mode for carrying out the present invention. Details of the structure may vary substantially without departing from the spirit of the invention, and exclusive use of all modifications that come within the scope of the appended claims is reserved. It is intended that the present invention be limited only to the extent required by the appended claims and the applicable rules of law.

CLAIMS

1. An electronic device readable storage medium storing executable instructions for inserting custom data content into a data stream in a communication network, the communication network comprising an access network, the instructions causing a processor to:

intercept a data stream in the access network;

identify an insertion point suitable for inserting the custom data content into the data stream;

select the custom data content from a local content storage repository located in the access network;

insert the custom data content into the data stream at the identified insertion point to create a custom data stream; and

forward the custom data stream to a user.

2. The medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to:

identify a targeted user for receiving content; and

select the custom data content based on the identity of the targeted user.

3. The medium of claim 2, wherein the custom data content is selected based on the geographic location of the targeted user.

4. The medium of claim 3, further comprising instructions to cause the processor to:

select additional custom data content when the geographic location of the targeted user changes;

identify a second insertion point suitable for inserting the additional custom data content into the data stream; and

insert the additional custom data content object into the data stream at the second insertion point.

5. The medium of claim 2, wherein the custom data content is selected based on an affinity group of the targeted user, the affinity group of the targeted user defining preference data for the targeted user.

6. The medium of claim 2, wherein the data stream is analyzed for semantic context information, and the custom data content is selected based on the semantic context information.

7. The medium of claim 1, wherein:

the data stream is a media stream containing streaming video or audio; and

the insertion point is a video or audio transition that defines a scene change or media object cache segment changeover.

8. The medium of claim 1, wherein:

the data stream is a media stream containing streaming video or audio; and

the insertion point is a streaming media state change that updates a state of the media stream.

9. The medium of claim 1, wherein the data stream contains a placeholder object, and the inserted custom data content modifies or replaces the placeholder object in the data stream.

10. The medium of claim 1, wherein the content object is selected based on a learned historical preference of the targeted user.

11. The medium of claim 1, wherein the communication network is a mobile telecommunication network.

12. A method in an electronic device for inserting custom data content into a data stream in a communication network, the communication network comprising an access network, the method comprising:

intercepting a data stream in the access network;

identifying an insertion point suitable for inserting the custom data content into the data stream;

selecting the custom data content from a local content storage repository located in the access network;

inserting the custom data content into the data stream at the identified insertion point to create a custom data stream; and

forward the custom data stream to a user.

13. The method of claim 12, further comprising:

identifying a targeted user for receiving content; and

selecting the content object based on the identity of the targeted user.

14. The method of claim 13, wherein the custom data content is selected based on the geographic location of the targeted user.

15. The method of claim 14, further comprising:

selecting additional custom data content when the geographic location of the targeted user changes;

identifying a second insertion point suitable for inserting the additional custom data content into the data stream; and

inserting the additional custom data content object into the data stream at the second insertion point.

16. The method of claim 13, wherein the custom data content is selected based on an affinity group of the targeted user, the affinity group of the targeted user defining preference data for the targeted user.

17. The method of claim 13, wherein the data stream is analyzed for semantic context information, and the custom data content is selected based on the semantic context information.

18. The method of claim 12, wherein:

the data stream is a media stream containing streaming video or audio; and

the insertion point is a video or audio transition that defines a scene change or media object cache segment changeover.

19. The method of claim 12, wherein:

the data stream is a media stream containing streaming video or audio; and

the insertion point is a streaming media state change that updates a state of the media stream.

20. The method of claim 12, wherein the data stream contains a placeholder object, and the inserted custom data content modifies or replaces the placeholder object in the data stream.

21. The method of claim 12, wherein the content object is selected based on a learned historical preference of the targeted user.

22. The method of claim 12, wherein the communication network is a mobile telecommunication network.

23. An electronic device for inserting custom data content into a data stream in a communication network, the communication network comprising an access network, the electronic device comprising:

a storage located in the access network for storing local content; and

a processor located in the access network for executing instructions, the instructions causing the processor to:

proxy a network transport protocol;

intercept a data stream in the access network;

identify an insertion point suitable for inserting the custom data content into the data stream;

select the custom data content from among the local content in the storage; and

insert the custom data content into the data stream at the identified insertion point.

24. The electronic device of claim 23, further comprising instructions to:

identify a targeted user for receiving content; and

select the content object based on the identity of the targeted user.

25. The electronic device of claim 24, wherein the custom data content is selected based on the geographic location of the targeted user.

26. The electronic device of claim 25, further comprising instructions to:

select additional custom data content when the geographic location of the targeted user changes;

identify a second insertion point suitable for inserting the additional custom data content into the data stream; and

insert the additional custom data content object into the data stream at the second insertion point.

27. The electronic device of claim 24, wherein the custom data content is selected based on an affinity group of the targeted user, the affinity group of the targeted user defining preference data for the targeted user.

28. The electronic device of claim 24, wherein the data stream is analyzed for semantic context information, and the custom data content is selected based on the semantic context information.

29. The electronic device of claim 23, wherein:

the data stream is a media stream containing streaming video or audio; and

the insertion point is a video or audio transition that defines a scene change or media object cache segment changeover.

30. The electronic device of claim 23, wherein:

the data stream is a media stream containing streaming video or audio; and

the insertion point is a streaming media state change that updates a state of the media stream.

31. The electronic device of claim 23, wherein the data stream contains a placeholder object, and the inserted custom data content modifies or replaces the placeholder object in the data stream.

32. The electronic device of claim 23, wherein the content object is selected based on a learned historical preference of the targeted user.

33. The electronic device of claim 23, wherein the communication network is a mobile telecommunication network.

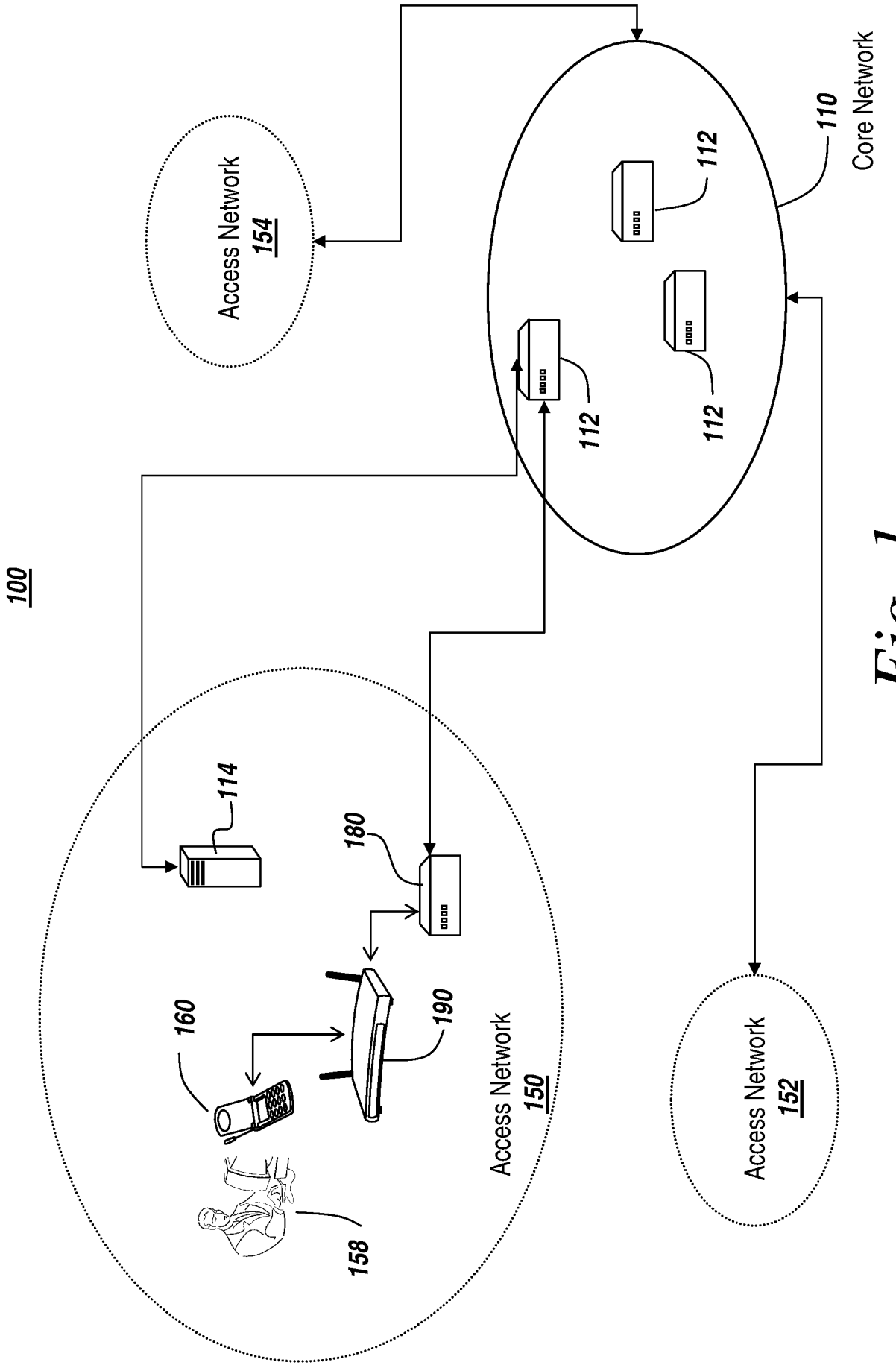
100
Access Network
154
110
Core Network
112
112
112
114
180
160
190
158
Access Network
150
Access Network
152

Fig. 1

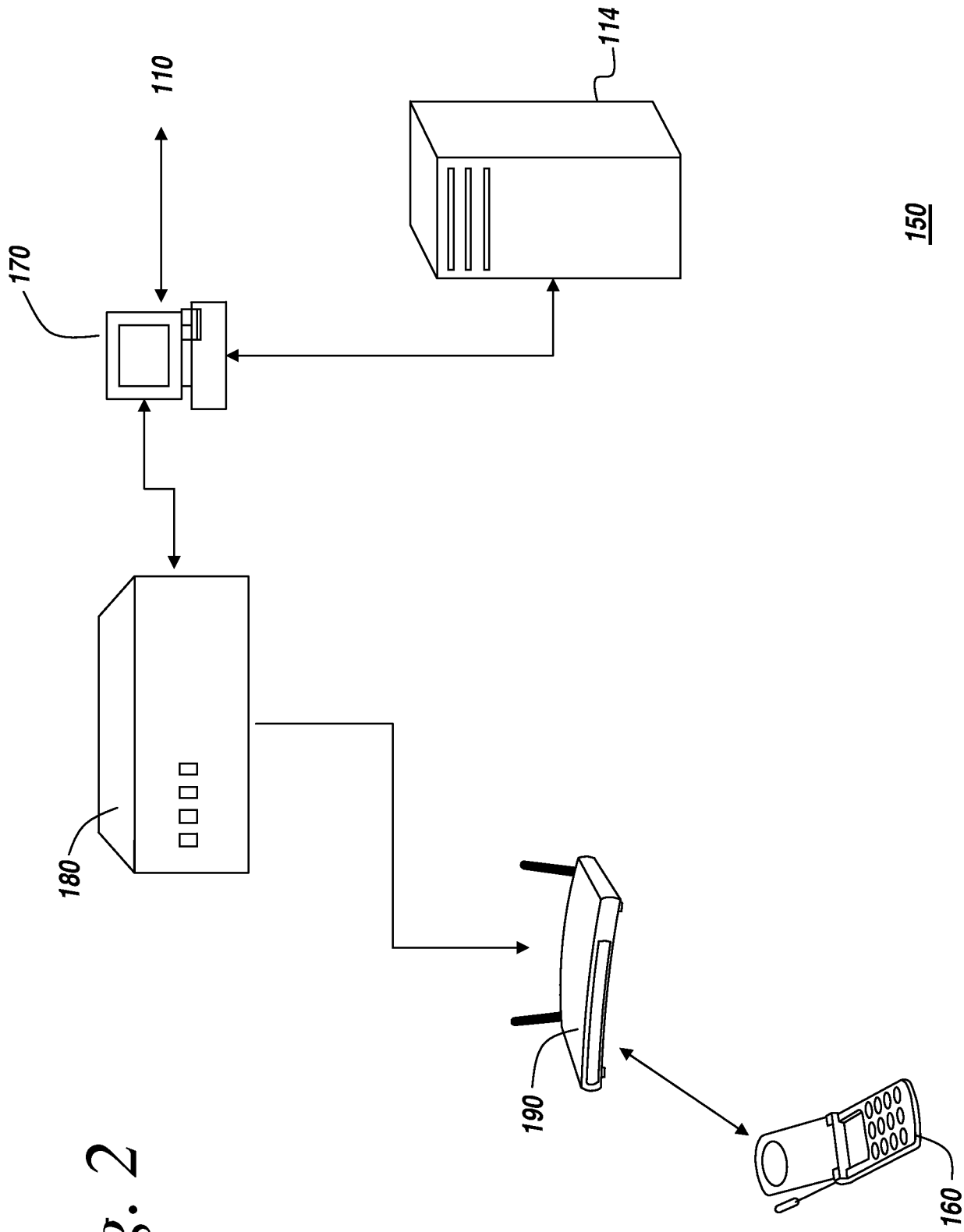

Fig. 2

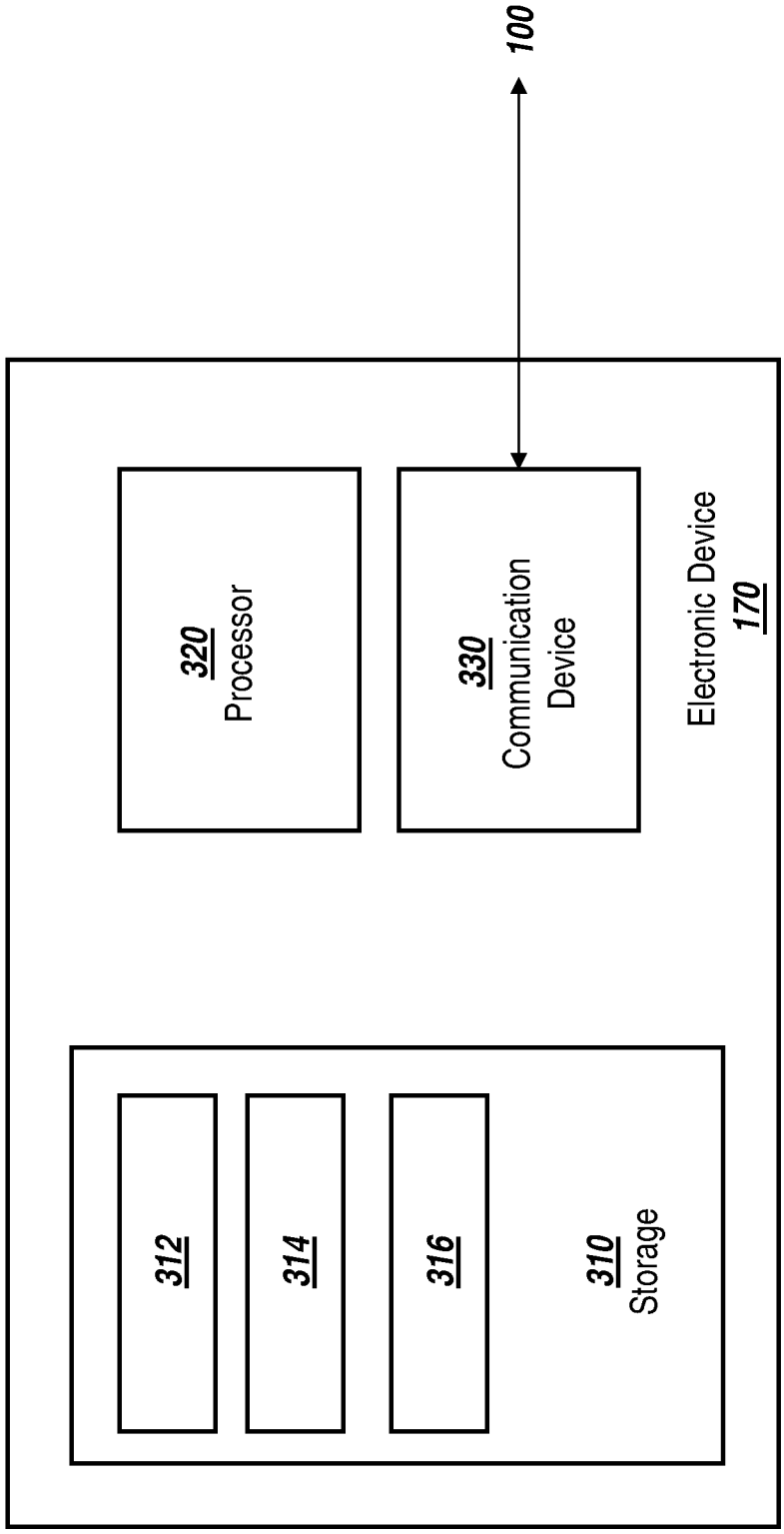
100
320
Processor
330
Communication
Device
Electronic Device
170
312
314
316
310
Storage

Fig. 3

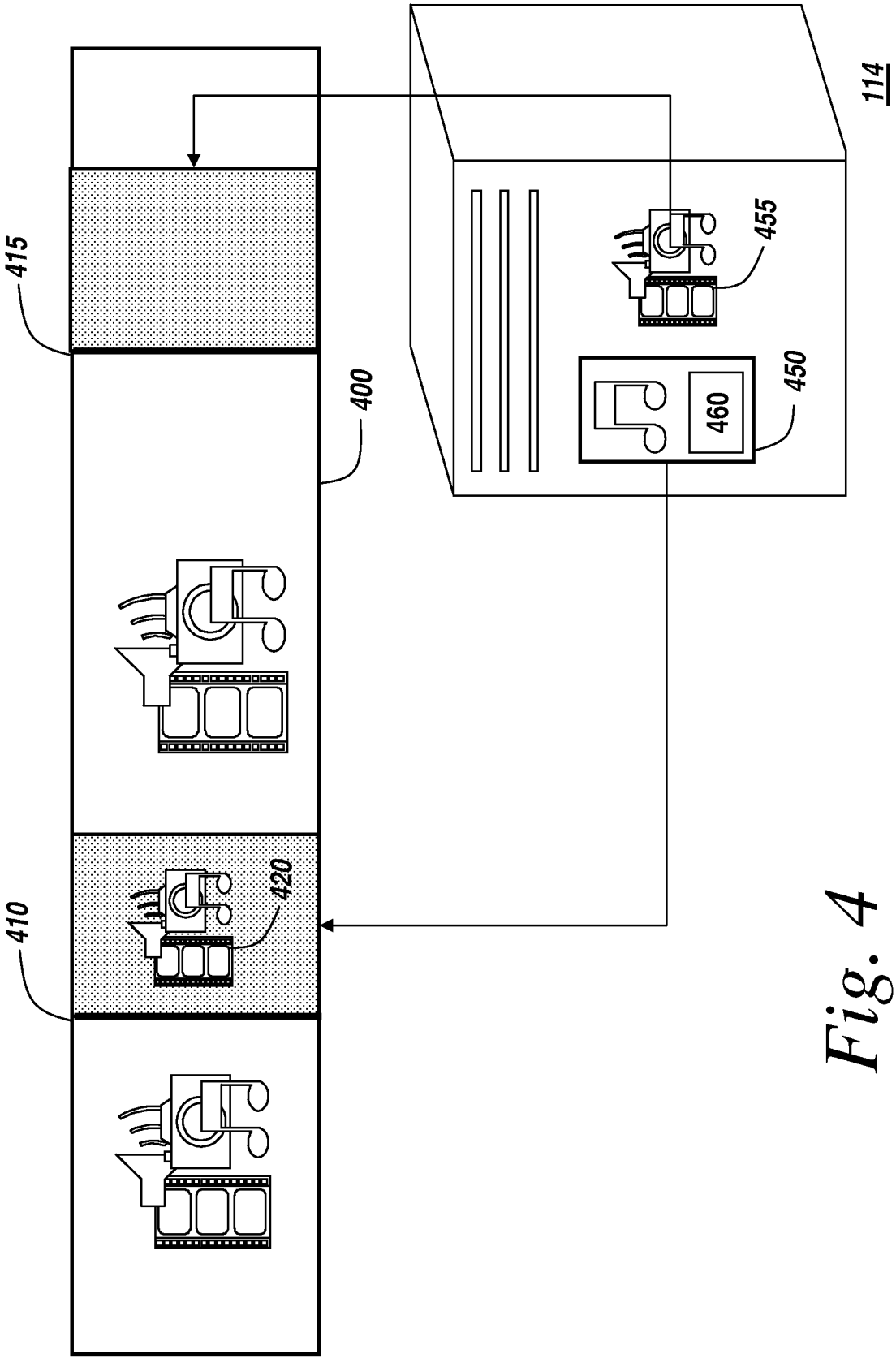

Fig. 4

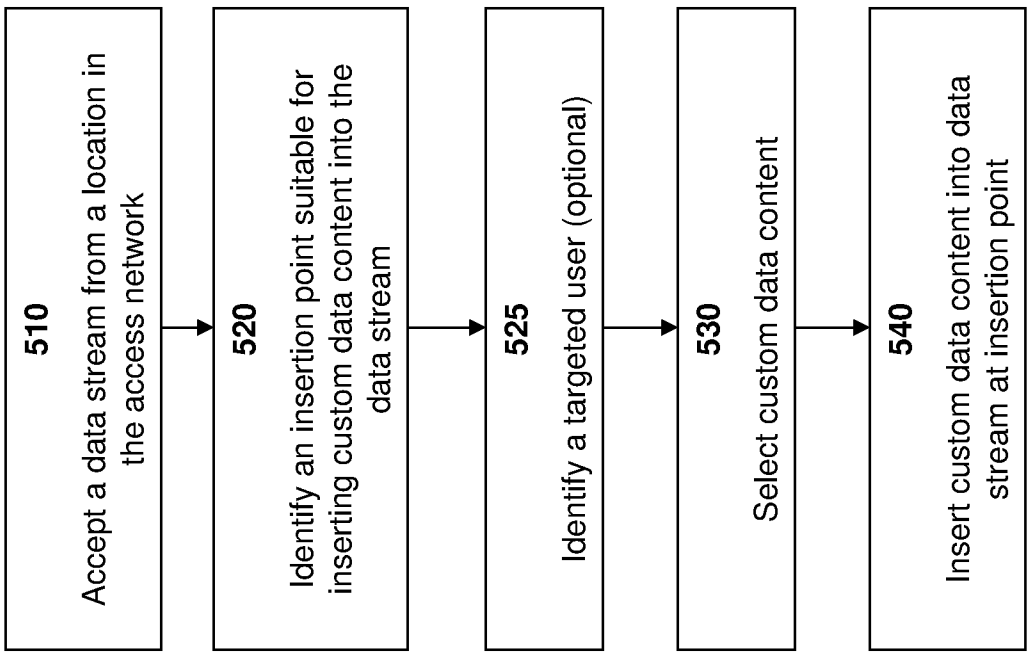
510
Accept a data stream from a location in the access network
520
Identify an insertion point suitable for inserting custom data content into the data stream
525
Identify a targeted user (optional)
530
Select custom data content
540
Insert custom data content into data stream at insertion point

Fig. 5

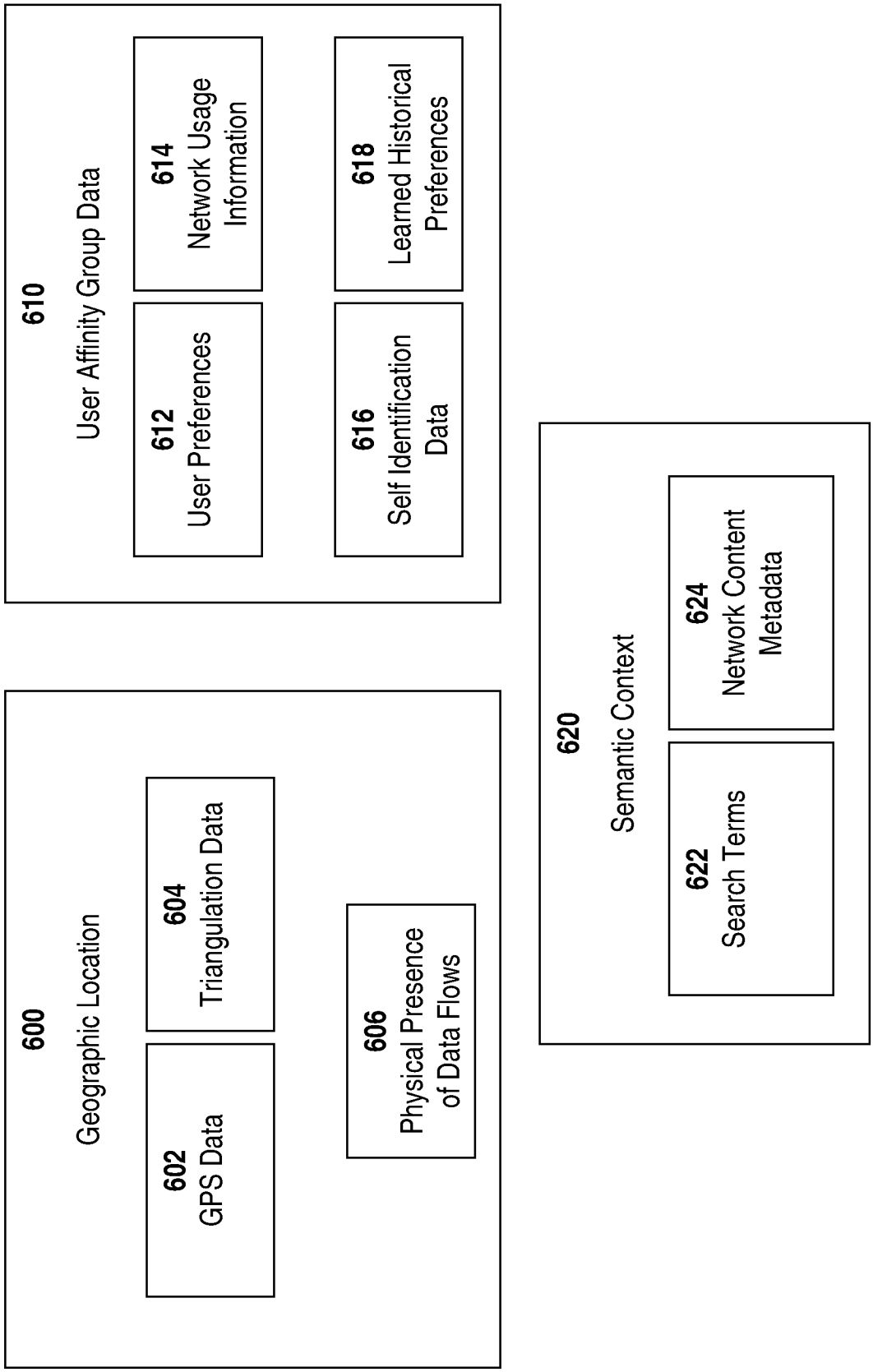
600
Geographic Location
602
GPS Data
604
Triangulation Data
606
Physical Presence of Data Flows
610
User Affinity Group Data
612
User Preferences
614
Network Usage Information
616
Self Identification Data
618
Learned Historical Preferences
620
Semantic Context
622
Search Terms
624
Network Content Metadata

Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 09/54998

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/16 (2009.01)
USPC - 709/217
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8):G06F 15/16 (2009.01)
USPC:709/217

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 725/32-36; 707/1, 9; 709/203, 226, 230-232; 370/464, 498, 522, 528

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest (PGPB, USPT, EAPB, JPAB); google: content, media, multimedia, multi media, multi-media, stream, streaming, indicator, insertion point, insert, intercept, placeholder, network, provider, delivery, movie, audio, video, music, learn, pattern, history.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0113243 A1 (Brey) 17 May 2007 (17.05.2007) entire document, especially, Paras. [0013], [0014], [0027], [0030], [0032], [0073]	1-33
A	US 2006/0161671 A1 (Ryman et al.) 20 July 2006 (20.07.2006) entire document	1-33
A	US 2006/0015904 A1 (Marcus) 19 January 2006 (19.01.2006) entire document	1-33
A	US 2008/0163290 A1 (Marko) 03 July 2008 (03.07.2008) entire document	1-33
A	US 2007/0294721 A1 (Haeuser et al.) 03 July 2008 (03.07.2008) entire document	1-33
A	US 2006/0136556 A1 (Stevens et al.) 22 June 2006 (22.06.2006) entire document	1-33
A	US 2004/0128682 A1 (Liga et al.) 01 July 2004 (01.07.2004) entire document	1-33
A	US 2004/0107169 A1 (Lowe) 03 June 2004 (03.06.2004) entire document	1-33
A	US 7,409,380 B1(Mazzagatti et al.) 05 August 2008 (05.08.2008) entire document	1-33

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 September 2009 (29.09.2009)	13 OCT 2009
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)