(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 August 2012 (02.08.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/101476 A1

(51) International Patent Classification:
H04H 20/08 (2008.01) *H04H 60/91* (2008.01)
H04H 40/90 (2008.01)

(21) International Application Number:
PCT/IB2011/003187

(22) International Filing Date:
7 December 2011 (07.12.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
221/CHE/2011 24 January 2011 (24.01.2011) IN

(71) Applicant *(for all designated States except US)*: **ALCATEL LUCENT** [FR/FR]; 3, avenue Octave Gréard, F-75007 Paris (FR).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **THIRUGNANA, Srinivasan** [IN/IN]; 238 Reliable Lakedew Residency Haralur, Main Road, Haralur, Bangalore 560034 (IN). **R, Krishna Kumar** [IN/IN]; 2459/I, 16th D Main, HAL II Stage, Bangalore 560008 (IN). **KAR, Pratip** [IN/IN]; Flat 152, Embassy Meadows, No 7, 8th Cross, S T Bed Layout, Koramangala, Bangalore 560034. (IN).

(74) Agent: **NICOLLE, Olivier**; Alcatel-lucent International, 32 avenue Kléber, F-92700 Colombes (FR).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: SYSTEM AND METHOD FOR ACCESSING A TELEVISION BROADCAST WITH A MOBILE DEVICE USING A WIRELESS CONNECTION

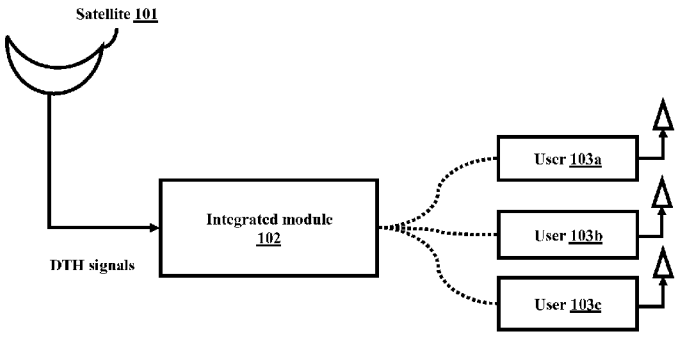

FIG. 1

(57) **Abstract**: System and method for accessing mobile TV over air interface is disclosed. The present invention relates to accessing television content and, more particularly, to accessing television content over air interface. Existing IP TV systems have drawbacks such as high cost in implementation, wide range of bandwidth requirement for transmission, poor quality of transmission and so on. The disclosed system employs an integrated module that enables a user to access IP TV content on his mobile device by minimizing the bandwidth requirement for transmission of the IP TV content. The integrated module comprises a DTH processor that establishes connection with the satellite in order to fetch television broadcast content. Further, the fetched content is processed by a baseband processor that converts the signals to a form that is suitable for transmission to the mobile device of the user over the air interface.

WO 2012/101476 A1

SYSTEM AND METHOD FOR ACCESSING A TELEVISION BROADCAST WITH A MOBILE DEVICE USING A WIRELESS CONNECTION

TECHNICAL FIELD

[001] The present invention relates to accessing television content and, more particularly, to accessing television content over an air interface.

BACKGROUND

[002] Present day systems that offer mobile TV access to the users are equipped with variety of infrastructure in order to make Internet Protocol (IP) content available on mobile phones of a user. Most of these existing implementations, standards, and literature on mobile TV would require the use of IP infrastructure of the service provider to provide mobile TV access. One such example is WiMax TV. In case of WiMax TV, TV content is provided to the user's mobile phone by utilizing the broadband connection to the WiMax base stations. The disadvantage associated with WiMax TV is the requirement of huge bandwidth in the core of the IP network.

[003] In another implementation, IP TV content is provided using available wireless access points. These wireless access points are employed for providing ubiquitous TV viewing experience to the user. However, these implementations have their own drawbacks - such as the requirement for broad range of bandwidth for broadband connection from the service provider to transmit IP TV content to the user. Generally these technologies have an inherent limitation of requiring to reserve and provide network infrastructure to support a bandwidth of 4Mbps per user from the base station or exchange to the IP server gateway. As an illustration, if we consider a conservative figure of 25 million users the bandwidth

requirement to be set aside in the core network would be in the order of tens of terabits. As a result, huge amount of network resources are consumed for transmitting TV content and consequently the amount of bandwidth available for other services such as video-on-demand, online gaming and so on is very less.

[004] The reduction in available bandwidth can result in congestion in the network leading to packet drops thereby affecting the quality of viewing experience of the services.

[005] Another technology that is employed for ubiquitous TV experience is based on Digital Video Broadcasting Satellite services to Handheld (DVB-SH) standards. While this technology does eliminate the need for high bandwidth in the IP backbone of the service provider network, it requires huge investment to build the end-to-end infrastructure. These require a mobile TV service delivery platform that performs content adaption and aggregates TV programs and rich multimedia services into IP service streams. Also, a broadcast station that maps the IP service streams on the satellite and terrestrial is required. Repeater radio resources would be required. Further these services employ a geo-stationary satellite that amplifies radio signals from Ka/Ku band to S-band. These signals that are based on DVB-SH radio interface are received from the hub and are transmitted directly towards the terminals. The terrestrial repeaters employed in this case would need to be capable of receiving the service bundles from the hub via a satellite backhaul system or via a terrestrial IP network and map them onto the terrestrial carrier resources in S-band. The 3G or 2G handset terminals employed by the user must be equipped with all the necessary features to receive the DVB-SH radio interface format signals. Due to the aforementioned requirements it is clear that this technology involves huge investment and is not economical.

[006] Some of the mobile Direct to Home (DTH) services offered

by the service providers provide television signals to a television receiver in a moving vehicle. Such systems require special auto tracking antenna that is placed on the roof of a moving vehicle and hence the costs involved are high. Moreover, the service requires the TV receiver to be connected to the cable inside the moving vehicle. Consequently, all the passengers in the moving vehicle need to watch a common channel in the TV receiver installed. There is no means to provide a personal viewing experience to the user based on an individual's choice of channel.

SUMMARY

[007] In view of the foregoing, an embodiment herein provides a system for providing television broadcast content to mobile devices over air interface. The system comprises an integrated module that is provided with at least one means configured for decoding at least one user request sent from a mobile device over the air interface, fetching television broadcast content requested by the user through a direct-to-home (DTH) part of the integrated module and sending the television broadcast content to the user's mobile device on the air interface. The integrated module is further configured for authenticating the user on receiving the request from the user. The integrated module is further configured for identifying if the user's request is for television broadcast content on decoding the request. The integrated module is further configured for converting the television broadcast content to internet protocol content suitable for transmission over the air interface. The integrated module is configured for receiving the user request on the air interface, wherein the air interface is at least one of wireless access point, third generation networks, cellular radio networks, wired local area network access point, Bluetooth and Zigbee. The integrated module further comprises of a direct to home processor and a

broadband processor.

[008] Also, disclosed herein is a method for providing television broadcast content to mobile devices over air interface. The method comprises an integrated module for decoding at least one user request sent from a mobile device over the air interface, the integrated module fetching television broadcast content requested by the user through a direct-to-home module and the integrated module sending the television broadcast content to the user's mobile device on the air interface. The method further authenticates the user on receiving the request from the user. The method further identifies if the user's request is for television broadcast content on decoding the request. The method further converts the television broadcast content to internet protocol content suitable for transmission over the air interface. The method further receives the user request on the air interface, wherein the air interface is at least one of wireless access point, third generation networks, cellular radio networks, wired local area network access point, Bluetooth and Zigbee. The method further employs a direct to home processor and a broadband processor for processing the television broadcast signals.

[009] Also, disclosed herein is an integrated module for providing television broadcast content to mobile devices over air interface. The module comprising a direct to home processor that is configured for receiving television broadcast content requested by the user from a satellite, processing the television broadcast content and sending the television broadcast content to a base station receiver processor. The base station receiver is configured for receiving the television broadcast content from the direct to home processor, converting the television broadcast content into suitable media stream for transmission and sending the received media stream to the user over air interface. The integrated module sends the media stream to the user over the air interface that is one of wireless access point,

third generation networks, cellular radio networks, wired local area network access point, Bluetooth, Femto cell and Zigbee

[0010] These and other aspects of the embodiments herein will be better appreciated and understood when considered in conjunction with the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

[0011] The embodiments herein will be better understood from the following detailed description with reference to the drawings, in which:

[0012] FIG. 1 illustrates the architecture of the system employed for transmission of television broadcast content, according to an embodiment herein;

[0013] FIG. 2 depicts an integrated module, according to an embodiment herein;

[0014] FIG.3 illustrates an implementation of transmitting television broadcast content using Femto cells, according to an embodiment herein; and

[0015] FIG. 4 is a flow chart depicting the process for transmitting television broadcast content, according to an embodiment herein.

DETAILED DESCRIPTION OF EMBODIMENTS

[0016] The embodiments herein and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments that are illustrated in the accompanying drawings and detailed in the following description. Descriptions of well-known components and processing techniques are omitted so as to not unnecessarily obscure the embodiments herein. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiments herein may be practiced and to further enable those of skill in

the art to practice the embodiments herein. Accordingly, the examples should not be construed as limiting the scope of the embodiments herein.

[0017] The embodiments herein disclose an integrated module for accessing television broadcast content on a mobile device by providing system and method therefore. Referring now to the drawings, and more particularly to FIGS. 1 through 4, where similar reference characters denote corresponding features consistently throughout the figures, there are shown embodiments.

[0018] A system and method for accessing television broadcast content on a mobile device through air interface is disclosed. In an embodiment, the mobile device may be any device that is capable of connecting to an air interface. The mobile device may be a cell phone, desktop, laptop, television, a portable screen with wireless access and the like. Air interface may include examples such as Wireless Local Area Network (WLAN), third generation networks, cellular radio networks, wired network access point, Bluetooth, Zigbee and the like.

[0019] The integrated module connects to a plurality of user's mobile devices. On the other end, the integrated module connects to the satellite in order to fetch the television broadcast content from satellite transmission. The integrated module is provided with the functionality of a Direct-to-Home (DTH) device and the Base Station Receiver (BSR) or a Femto. On obtaining a request from the user of a mobile device, the integrated module decodes the request. The user requested television broadcast content is fetched and sent to the user over the air interface. In addition, the integrated module also supports cellular network functions such as handling calls if the mobile device is a cell phone and the like. As a result, the user is able to access any television broadcast content on his mobile device at any instant of time.

[0020] FIG. 1 illustrates the architecture of the system employed for

transmission of television broadcast content, according to an embodiment herein. The system comprises a satellite 101, an integrated module 102 and plurality of users 103 who are connected to the integrated module 102.

[0021] The satellite 101 may be a geo-stationary satellite that provides means to transmit television broadcast content. Further, content may include user requested channel, audio, video or a combination of the same. As depicted, the satellite 101 broadcasts DTH signals to the integrated module 102.

[0022] Users 103 may be plurality of people who would like to access the television broadcast content. The user's 103 mobile device accesses the information sent from the integrated module 102 through its antenna. Further, the user 103 may be subscribed to the service with a service provider. In an embodiment, the user may be charged for subscription to the service. Different users 103 may be employing different mobile devices for accessing the television broadcast content. In an example, user 103a may employ a cell phone; user 103b may employ a laptop and so on. The integrated module 102 is responsible for providing access to television broadcast content to the user. The integrated module 102 connects to the users 103 over the air interface. On receiving a request from the user 103, the integrated module 102 authenticates the user 103. The user request is then decoded. On determining that the user request is for television broadcast content, the integrated module 102 selects the required satellite stream101. The broadcasted satellite signals are received by the integrated module 102. The integrated module 102 then converts the television signals into internet protocol signals that are suitable for transmission over the air interface. Further, the television broadcast content is sent to the user 103. The air interface may be wireless access point, third generation networks, macro cell, Femto cell, WiMax and so on.

[0023] FIG. 2 depicts an integrated module, according to an

embodiment herein. The integrated module 102 integrates the DTH processor 201 and the Baseband Service Router (BSR) processor 207 within it. The DTH processor 201 and the BSR processor 207 together help in processing the obtained television broadcast content that is requested by the user 103. The DTH processor 201 comprises of a RF Tuner board 202, demultiplexer and decoder 203, descrambler 204, a security/authentication module 205 and an AV output 206. On obtaining the television broadcast content from the satellite, the DTH processor 201 processes the signals so that it is converted to a form that is suitable for the transmission.

[0024] The obtained television broadcast content is sent to the RF tuner board 202. The radio frequency tuner board 202 tunes itself so that it can receive the required RF signals obtained from the satellite 101. The RF tuner board 202 is tuned to the range such that television broadcast signals are obtained. The RF tuner interfaces to a demultiplexer and decoder 203.

[0025] The demuiltiplexer and decoder 203 receives the RF signals from the RF tuner board 202. The received signals are de-multiplexed and decoded in order to make it suitable for transmission to the user 103.

[0026] The signals are then sent to the descrambler 204. The descrambler 204 reverses the manipulations on the decoded signal in order to encode the received signal. The descrambler 204 ensures that the signals received from the satellite (that are scrambled) are descrambled and converted into a form that is suitable for transmission to the user 103. The descrambled signals are fed into the component of the BSR processor 207 in mpeg format.

[0027] The security/ authenticate module 205 controls the functioning of demuiltiplexer and decoder 203 and the Baseband processor. The security/ authenticate module 205 issues control signals to the demuiltiplexer and decoder 203 and the Baseband processor and thus ensures security to the transmitted signals.

[0028] The A/V output 206 is an optional module; the integrated modules 102 may or may not employ such an A/V output 206. The A/V output 206 separates the audio and video component of the television broadcast content and transmits the same to the audio output device and video output device at the user end.

[0029] The BSR processor 207 comprises a Modulator/Demodulator 208, Baseband processor 209 and Media stream generator 210. The media stream generator 210 receives the mpeg streams from the DTH processor 201. On obtaining the media streams the media stream generator collects the mpeg stream and converts it into a format suitable for transmission to the user 103.

[0030] The signals are then input to a Baseband processor 209. The baseband processor 209 processes the mpeg signals into baseband signals so that they may be transmitted to the user 103 over the air interface.

[0031] The signals are then input to a Modulator/Demodulator 208. The modulator/demodulator 208 performs modulation or demodulation on the obtained DTH signals. The output from the modulator/demodulator 208 is sent to the user's mobile device over the air interface.

[0032] FIG.3 illustrates an implementation of transmitting television broadcast content using Femto cells, according to an embodiment herein. As depicted in the figure is the integrated DTH- Femto module 301. The Femto Cell in integration with the integrated module 102 is called as integrated Femto Cell 301. The implementation comprises a satellite 101, an integrated Femto Cell 301 and plurality of users 103.

[0033] The satellite 101 may be a geo-stationary satellite that provides means to transmit television broadcast content. Further, content may include user requested channel, audio, video or a combination of the same. As depicted, the satellite 101 broadcasts DTH signals to the integrated module 102 for providing access to content requested by a user

103.

[0034] The integrated DTH-Femto module 301 is an integration of the Femto Cell with the DTH module. The integrated DTH-Femto module 301 is configured to fetch DTH signals from the satellite 101. For this purpose, the integrated DTH-Femto module 301 is also equipped with a DTH processor 201 and a baseband processor 207. The DTH signals that comprise of television broadcast content are processed by the DTH processor 201. The DTH processor 201 then converts the DTH signals to streams that are fed into the BSR processor 207. Further, the BSR processor 207 processes the signals and converts it into a form that is suitable for transmission to the mobile device of the user 103 over the air interface.

[0035] In an embodiment, the integrated DTH-Femto module 301 may be employed at locations such as coffee shops, internet cafes, bus terminals, shopping centers, malls and the like. As a result, wherever a user is near such terminals and wishes to access television broadcast content he may send a request for the same to the integrated DTH-Femto module 301. The integrated DTH-Femto module 301 fetches user requested content and transmits the same to the user's mobile device.

[0036] In another embodiment, the integrated DTH-Femto module 301 may also be placed at different locations within a residential building, within homes and the like. The integrated DTH-Femto module 301 enables the user 103 to access television content anywhere at any instant of time.

[0037] The users 103 may comprise of people who would like to access the television broadcast content. The user's 103 are located within the range of the Femto and thus access the television content through the integrated DTH-Femto module 301. The user's 103 mobile device access the information sent from the integrated DTH-Femto module 301 through its antenna.

[0038] FIG. 4 is a flow chart depicting the process for transmitting television broadcast content, according to an embodiment herein. A user 103 who is interested in accessing television broadcast content may subscribe for the service with the service provider. Further, when a user would want to view television content on his mobile device the user 103 may send (401) a request for the content. In an example, the user may want to view live football match and may send a request for the sports channel. The request may be sent in a pre-defined format as specified by the service provider. Once the user 103 enters his request, the request is recognized (402) by the application that resides on the mobile device of the user. The application then sends (403) the request to the integrated module 102. On receiving the request, the integrated module 102 authenticates the user 103. The integrated module makes a check (404) if the user 103 is subscribed for the service. If the user is not subscribed for the service, the integrated module 102 intimates (405) the user 103 of the same by sending a message. If the user 103 is a subscribed user 103, the integrated module 102 decodes (406) the request and determines that the request is for a television channel. The DTH processor 201 obtains user requested channel content from the satellite 101. The obtained satellite broadcast signals are processed by the DTH processor 201. During the processing, the television broadcast channel signals are converted into internet protocol signals suitable for transmission over the air interface. The channel content is then sent (407) to the integrated module 102 component that further transmits the content to the user 103. The integrated module 102 further sends (408) the channel content to the user's 103 mobile device. The user 103 is able to view any desired channel content by employing the integrated module 102. The various actions in method 400 may be performed in the order presented, in a different order or simultaneously. Further, in some embodiments, some actions listed in FIG. 4 may be omitted.

[0039] In an embodiment, the system offers benefits to the users as single time installation is needed and no further recurring costs are involved. The user is provided television experience at any location. Further, from the point of view of the service providers, as more users subscribe for the service the revenue generated is more. In addition the scarce core network resources are freed up allowing the service provider to employ the resources for other bandwidth intensive applications like video-on- demand, interactive TV, online gaming and so on. This leads to generation of more revenues.

[0040] The embodiments disclosed herein can be implemented through at least one software program running on at least one hardware device and performing network management functions to control the network elements. The network elements shown in Fig. 1 include blocks which can be at least one of a hardware device, or a combination of hardware device and software module.

[0041] The embodiment disclosed herein specifies a system for accessing television broadcast content to mobile device. The mechanism allows accessing television broadcast content to mobile devices over air interface by providing a system thereof. Therefore, it is understood that the scope of the protection is extended to such a program and in addition to a computer readable means having a message therein, such computer readable storage means contain program code means for implementation of one or more steps of the method, when the program runs on a server or mobile device or any suitable programmable device. The method is implemented by software modules being executed on at least one hardware device. The hardware device can be any kind of device which can be programmed including e.g. any kind of computer like a server or a personal computer, or the like, or any combination thereof, e.g. one processor and two FPGAs. The method embodiments described herein could be

implemented in pure hardware or partly in hardware and partly in software. The device may also include only software means. Alternatively, the invention may be implemented on different hardware devices, e.g. using a plurality of CPUs.

[0042] The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of the claims as described herein.

WE CLAIM:-

1. A system for providing television broadcast content to mobile devices over air interface, said system comprising an integrated module with at least one means configured for

decoding at least one user request sent from a mobile device over said air interface;

fetching television broadcast content requested by said user from a satellite through a direct to home module; and

sending said television broadcast content to said user's mobile device on said air interface.

2. The system as in claim 1, wherein said integrated module is further configured for authenticating said user on receiving said request from said user.

3. The system as in claim 1, wherein said integrated module is further configured for identifying if said user's request is for television broadcast content on decoding said request.

4. The system as in claim 1, wherein said integrated module is further configured for converting said television broadcast content to Internet Protocol content suitable for transmission over said air interface.

5. The system as in claim 1, wherein said integrated module is configured for receiving said user request on said air interface, wherein said air interface is at least one of:

wireless access point;

third generation networks;

cellular radio networks;

wired local area network access point;

Bluetooth;

Femto cell; and

Zigbee.

6. The system as in claim 1, wherein said integrated module further comprises of a direct to home processor and a broadband processor.

7. A method for providing television broadcast content to mobile devices over air interface, said method comprising providing an integrated module for

decoding at least one user request sent from a mobile device over said air interface;

fetching television broadcast content requested by said user by said integrated module from a satellite through a direct to home module; and

sending said television broadcast content to said user's mobile device on said air interface by said integrated module.

8. The method as in claim 7, wherein said method further authenticates said user on receiving said request from said user.

9. The method as in claim 7, wherein said method further identifies if said user's request is for television broadcast content on decoding said request.

10. The method as in claim 7, wherein said method further converts said television broadcast content to internet protocol content suitable for transmission over said air interface.

11. The method as in claim 7, wherein said method further receives said user request on said air interface, wherein said air interface is at least one of:

wireless access point;

third generation networks;

cellular radio networks;

wired local area network access point;

Bluetooth;

Femto cell; and

Zigbee.

12. The method as in claim 7, wherein said method further employs a direct to home processor and a broadband processor for processing said television broadcast signals.

13. An integrated module for providing television broadcast content to mobile devices over air interface, said module comprising

a direct to home processor that is configured for

receiving television broadcast content from a satellite requested by the user; processing said television broadcast content; and

sending said television broadcast content to a base station receiver processor;

said base station receiver that is configured for

receiving said television broadcast content from said direct to home processor; converting said television broadcast content into suitable media stream for transmission; and

sending said received media stream to said user over air interface.

14. The integrated module as in claim 13, wherein said integrated module sends said media stream to said user over said air interface wherein said air interface is interface is at least one of:

wireless access point;

third generation networks;

cellular radio networks;

wired local area network access point;

Bluetooth;

Femto cell; and

Zigbee.

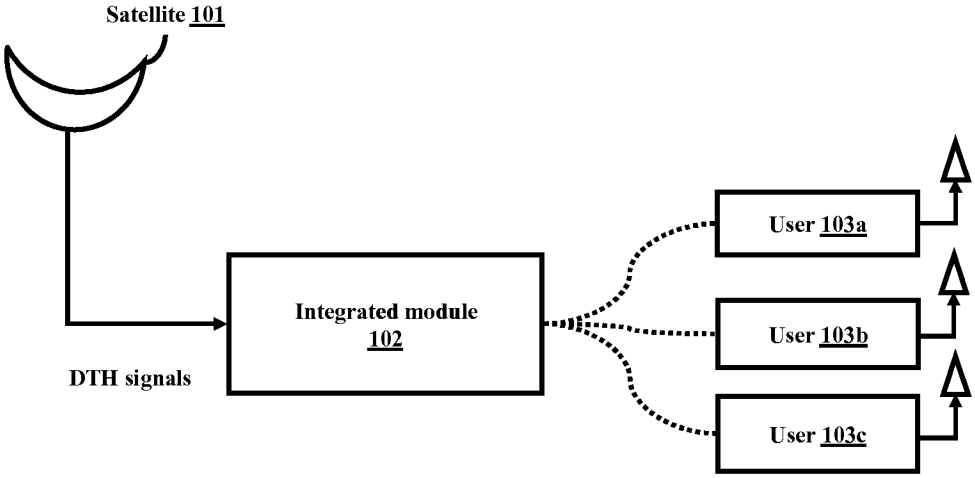
Satellite 101
Integrated module
102
DTH signals
User 103a
User 103b
User 103c

FIG. 1

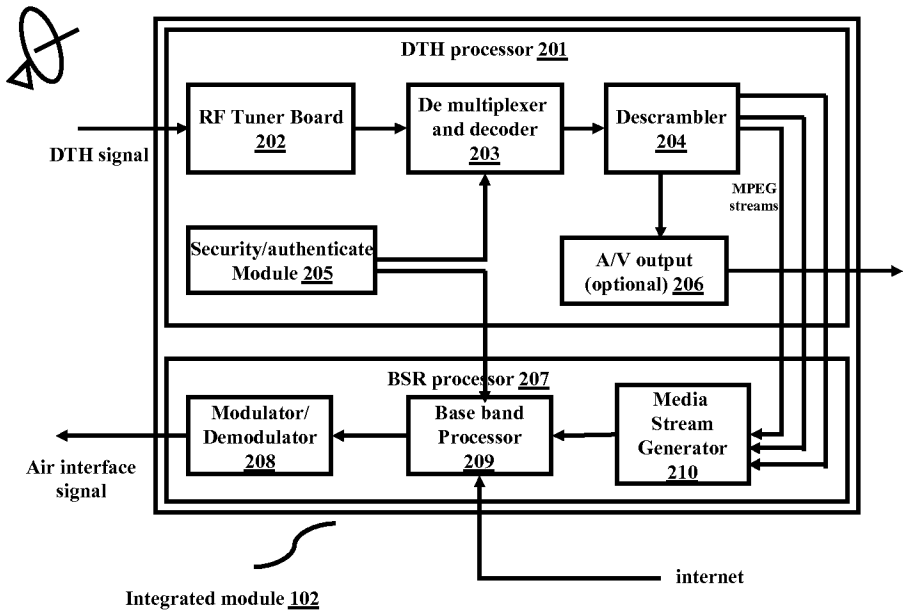
DTH processor 201
RF Tuner Board 202
De multiplexer and decoder 203
Descrambler 204
DTH signal
MPEG streams
Security/authenticate Module 205
A/V output (optional) 206
BSR processor 207
Modulator/ Demodulator 208
Base band Processor 209
Media Stream Generator 210
Air interface signal
internet
Integrated module 102

FIG. 2

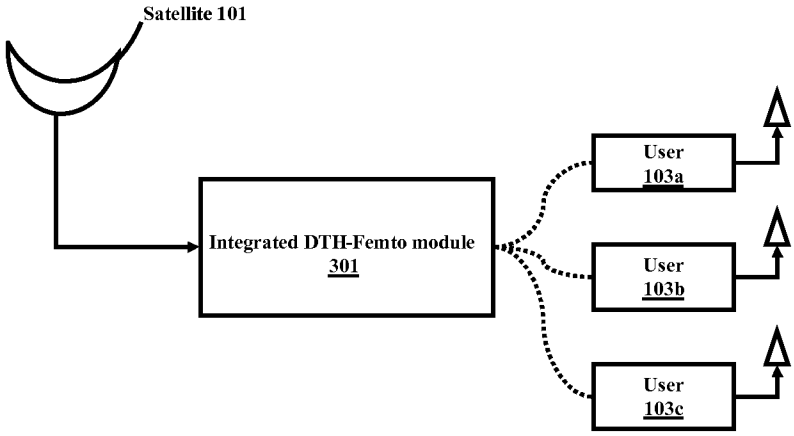
Satellite 101
Integrated DTH-Femto module
301
User
103a
User
103b
User
103c

FIG. 3

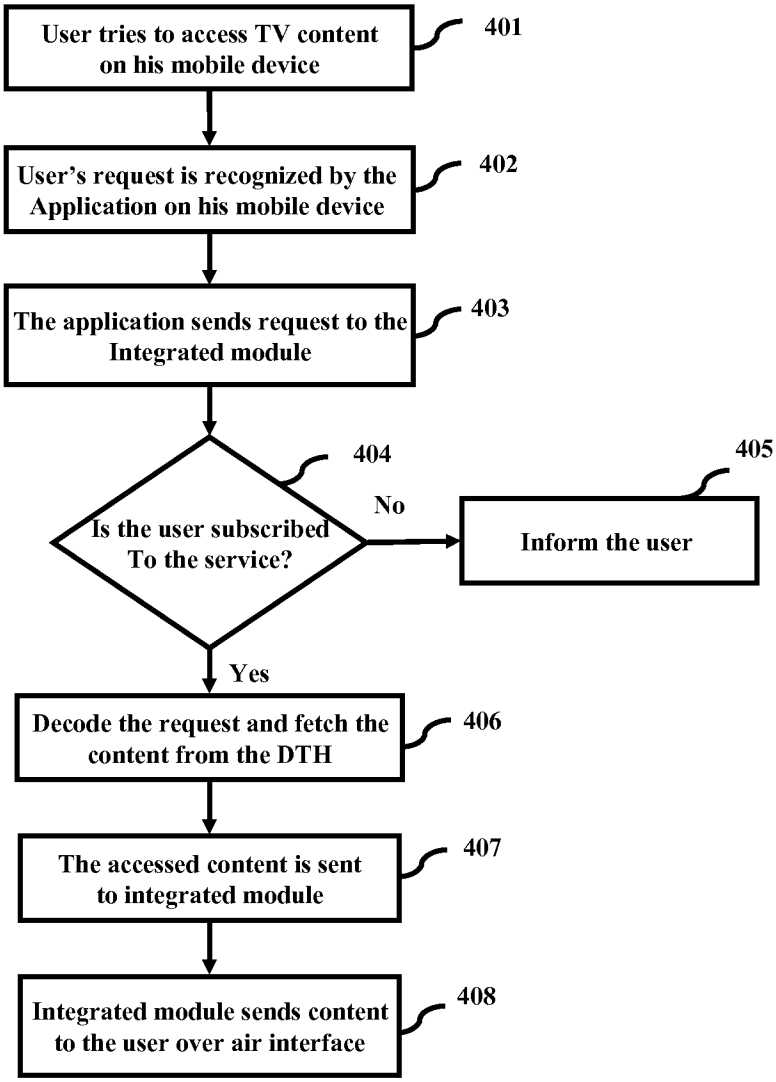
User tries to access TV content on his mobile device
401
User's request is recognized by the Application on his mobile device
402
The application sends request to the Integrated module
403
404
Is the user subscribed To the service?
No
405
Inform the user
Yes
Decode the request and fetch the content from the DTH
406
The accessed content is sent to integrated module
407
Integrated module sends content to the user over air interface
408

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/003187

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04H20/08 H04H40/90 H04H60/91
ADD.

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)
H04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 7 343 157 B1 (MITCHELL JAMES P [US]) 11 March 2008 (2008-03-11) column 2, line 55 - line 60; claims 1, 3, 11; figure 3 column 5, line 5 - line 9 column 5, line 14 - line 18 column 5, line 54 - line 63 column 6, line 50 - line 53 column 8, line 35 - line 46 column 4, line 48 - line 54 column 3, line 4 - line 14 column 7, line 39 - line 52 column 8, line 25 - line 30 ----- -/--	1-3,6-9, 12,13

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* 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 document 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
22 March 2012	30/03/2012

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	De Haan, Aldert

2

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/003187

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004/082291 A1 (THOMSON LICENSING SA [FR]; LANKFORD DOUGLAS EDWARD [US]; WEHMEYER KEIT) 23 September 2004 (2004-09-23) page 8, line 19 - line 24; claims 11, 12	4,10
A	US 2007/049192 A1 (HOFFMANN JOHN E [US] ET AL) 1 March 2007 (2007-03-01) paragraph [0040] - paragraph [0041]	5,11,14

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2011/003187

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7343157 B1	11-03-2008	NONE	
WO 2004082291 A1	23-09-2004	EP 1602237 A1	07-12-2005
		JP 2006522544 A	28-09-2006
		KR 20050113645 A	02-12-2005
		WO 2004082291 A1	23-09-2004
US 2007049192 A1	01-03-2007	NONE	