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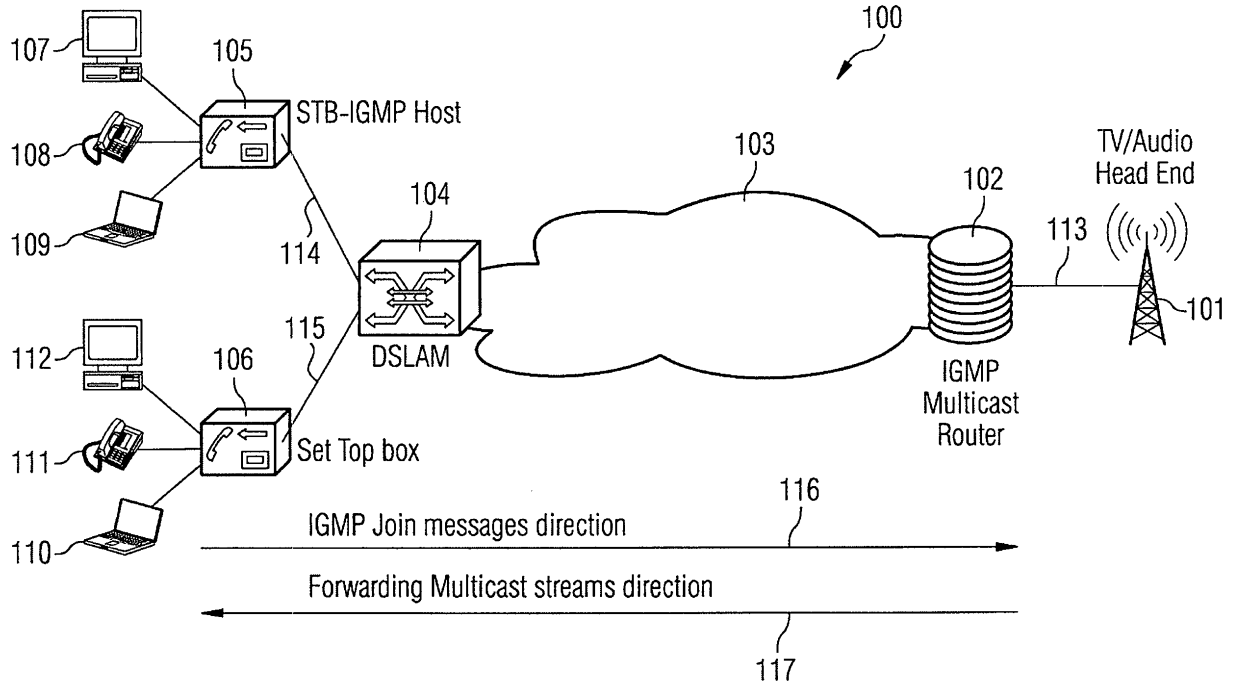
(54) Automatic TV/audio channel switching upon reception of information from special control channels

(57) According to an exemplary embodiment of the present invention, an automatic switching of a receiving station is provided, triggered by an external entity. Triggering of the switching is based on the transmission of a virtual channel control channel which comprises information about the channels to be selected, such as channel IDs.

FIG 1



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Description

[0001] The invention relates to the field of communication broadcast. In particular, the invention relates to a method for providing a virtual channel for a receiving station, a receiving station and a communication system.

[0002] Currently it is common for viewers/listeners to search for programs of interest over an entire set of available or subscribed TV/audio channels they want to see/listen. Such television (TV) or audio channels may comprise, for example, news, sports, science, entertainment or music data. Such a program search may especially be performed during or after system power up or at the end or interval of the program they were seeing/listening to. This may normally result in the viewer/listener having to manually switch (zap) possibly many channels in order to find what he/she prefers.

[0003] It would be desirable to provide for an improved channel selection.

[0004] The invention provides a method for providing a virtual channel for a receiving station, a receiving station and a communication system with the features according to the independent claims.

[0005] It should be noted that the following described exemplary embodiments of the invention apply not only for the method, but also for the receiving station and the communication system.

[0006] According to an exemplary embodiment of the present invention, a method for providing a virtual channel for a receiving station is provided, the method comprising the steps of receiving information from a virtual channel control channel in the receiving station and automatically switching to a normal channel on the basis of the information from the virtual channel control channel, wherein the information comprises a channel reference corresponding to a normal channel and wherein the information is transmitted from a transmitting station to the receiving station via the virtual channel control channel.

[0007] In other words, the method may provide for an automated channel selection (switching) which is for example triggered by an external entity, such as an individual person or a company. Therefore, the channel switching is triggered automatically at the TV/audio system for example Internet protocol television (IPTV, radio system) by the external entity under permission of the viewer/listener which previously and explicitly requested/accepted such a service.

[0008] Thus, the viewer/listener may be able to select his preferred virtual channel (for example rock star Y music selection) resulting from timely change of "normal" available or subscribed broadcast channel (such as, for example, MTV, Viva, VH1, history channel musician biographies, ...), following a certain general or more specific subject and whose program/channel choice may for example normally but not necessarily be produced in real or near real time by the external entity.

[0009] Thus, a method may be provided that may make it possible for viewers or listeners to be able to view or listen to those virtual channels. Furthermore, the method according to an aspect of the invention provides the steps a multimedia operator (such as, for example, IPTV or radio operators) have to perform in order to provide such services from the system that supports such services.

[0010] Upon the viewer/listener selection of a specific virtual channel (for example rock star Y music selection), the set top box (STB) or any enhanced video/audio receiver like a TV set would, at customer premise, tune to the specific "virtual channel" control channel, which may constantly simply broadcast the virtual channels "normal" channel choice to be viewed/listened to at the moment and then automatically switches/tunes to that channel choice, which may change over time, thus requiring the STB to retune. Such "virtual channel" control channel choices may, according to an exemplary embodiment of the present invention, be produced from external entities, which may be dedicated companies, such as, for example, child education companies, or interest groups, such as, for example anti-violence media association, or individuals, such as, for example, rock star Y preference.

[0011] According to another exemplary embodiment of the present invention, the receiving station comprises at least one of a television apparatus for visualizing television programs, a set top box, a radio apparatus for playing an analogue radio broadcast, and a radio apparatus for playing a radio digital broadcast.

[0012] Thus, it should be noted, that the present invention is not limited to television programs, but may also be applied to other multicast protocols. The invention is not limited to the Internet group management protocol (IGMP).

[0013] According to another exemplary embodiment of the present invention, the information transmitted in the virtual channel control channel is generated by an external entity selected from the group comprising a dedicated company, an interest group, and an individual.

[0014] For example, an individual may provide the information transmitted by the virtual channel control channel to the receiving station. The receiving station can then automatically switch to the normal channel suggested by the individual.

[0015] According to another exemplary embodiment of the present invention, the virtual channel control channel is transmitted continuously or periodically to the receiving station, such that the automatic switching to the normal channel can be performed in real time or near real time.

[0016] Therefore, the user is for example able to automatically follow the program selection of the external entity immediately.

[0017] According to another exemplary embodiment of the present invention, the receiving station is adapted for recognizing the virtual channel control channel as a special channel which differs from a normal channel.

[0018] For example, when the user switches from a normal channel to the virtual channel control channel, information is presented to the user so that he/she knows

that he/she is watching/listening to the virtual channel.

[0019] According to another exemplary embodiment of the present invention, the virtual channel control channel comprises a plurality of individual channel references, each reference corresponding to a respective normal channel.

[0020] Furthermore, according to another exemplary embodiment of the present invention, the receiving station allows for a selection of the virtual channel control channel by a user.

[0021] For example, the user may be able to choose between a plurality of different virtual channel control channels or virtual channels, each virtual channel control channel corresponding to an individual external entity.

[0022] According to another exemplary embodiment of the present invention, a receiving station for providing a virtual channel is provided. The receiving station is adapted for receiving information from a virtual channel control channel and for automatically switching to a normal channel on the basis of the information from the virtual channel control channel, wherein the information comprises a channel reference corresponding to a normal channel, and wherein the information is transmitted from a transmitting station to the receiving station via the virtual channel control channel.

[0023] Furthermore, according to another exemplary embodiment of the present invention, the receiving station is adapted for identifying the virtual channel control channel.

[0024] According to another exemplary embodiment of the present invention, a communication system for providing a virtual channel is provided, wherein the communication system comprises a transmitting station and a receiving station. The transmitting station is adapted for transmitting information via a virtual channel control channel, the information comprising a channel reference corresponding to a normal channel to the receiving station. The receiving station is adapted for receiving the information from the virtual channel control channel and for automatically switching to a normal channel on the basis of the information from the virtual channel control channel.

[0025] It may be seen as a gist of an exemplary embodiment of the present invention that switching to the normal channel is performed automatically, triggered by the external entity. Therefore, the user for example only has to switch on his receiving station (for example by switching on a set top box) and tune to the virtual channel control channel. Then, the receiving station receives the channel references (channel information) transmitted via the virtual channel control channel and tunes to the respective identified normal channel automatically, without further user interaction being necessary.

[0026] No training of the set top box/receiving station by the user has to be performed. By choosing the virtual channel control channel, the user in fact chooses the external entity responsible for channel selection and channel switching. Thus, a network related switching is provided and no end customer oriented switching.

[0027] These and other aspects of the present invention will become apparent from and elucidated with reference to the embodiments described hereinafter.

[0028] Exemplary embodiments of the present invention will now be described in the following, with reference to the following drawings.

[0029] Fig. 1 shows a schematic representation of a multicast network, comprising a receiving station according to an exemplary embodiment of the present invention.

[0030] Fig. 2 shows a communication system according to an exemplary embodiment of the present invention.

[0031] Fig. 3 shows a flow-chart of a method according to an exemplary embodiment of the present invention.

[0032] The illustration in the drawings is schematically. In different drawings, similar or identical elements are provided with the same reference numerals.

[0033] Fig. 1 shows a schematic representation of a multicast network, in which a receiving station according to an exemplary embodiment of the present invention is implemented.

[0034] It is already known in the art to provide viewers with suggestions of the programs/channels to see based on the preferences either configured or learned from the customer STB and from the broadcasted characteristics of each channel. The STB then suggests a channel to be viewed, so that case the viewer accepts the suggestion then the STB will tune to the suggested channel.

[0035] However, this approach is based on viewer habits (such as previously seen programs, for example) or preferences configuration (e.g., the user likes action movies), and the channel switching procedure follows an algorithm that is run at the STB, not an external source like a dedicated company, group of interest or individual.

[0036] This approach may still require lots of interaction from the viewer to accept or deny the suggestions that appear as possible viewer interesting programs begin or about to begin.

[0037] Channel switching at STB is based on the information provided by the electronic program guide (EPG) regarding the category of each program and its starting/ending time. This channel categorization and beginning/ending times' dependencies are, according to an aspect of the invention, solved with an external source.

[0038] It should be noted, that not always the publicized schedule for the beginning of a program in a channel really matches its beginning (e.g., there may be lots of commercials before the start of the program or the program may be delayed for an other reason) that could be for many viewers/listeners better passed with other breaks (e.g., music from a music channel, news, ...) or simply remain seeing the current program that has not yet ended.

[0039] In other words, the above discussed known method (which depends on user habits) may not provide the real-time or near real-time virtual channel control suggestion according to what is really being transmitted, but only according to what has been publicized.

[0040] The above known approach may not provide a broad selection choice to the viewers that may want to see completely different programs from though previously seen in the past.

[0041] One may think that the presented solution may be solved by having new channels being broadcasted that really contain the contents of other channels instead of simply the references to the channels to be seen/listen and letting the STB doing the tuning automatically over the time. However, this may lead to:

- A much higher bandwidth to transmit such a channel, instead of simply the current channel to be viewed/listen which consumes much less bandwidth.

- An additional bandwidth to be planned to account with such new "normal" channel bandwidths that increase considerable with the number of virtual channel (control channels). This may result in a much smaller number of virtual channels which can be supported unlike the case when using the technique of the invention presented here.

- Legal issues because that would mean having to transmit the real video/data signals from other channels (some of them which might not have been subscribed by customer). This may be contrary to the approach presented for this invention because such an approach brings less legal issues since only external entities' choices are broadcasted and not the video/audio contents of the normal channels.

[0042] The prior art radio broadcast system via its RDS (Radio Data System) may allow a similar functionality as the above known method, but not the functionality described by this invention.

[0043] With respect to Fig. 1, the multicast network comprises a TV/audio head end or transmitting station 101, which is adapted for transmitting broadcast data to an IGMP multicast router 102, for example via transmission line 113.

[0044] Furthermore, the multicast network 100 is adapted for transmitting this data via the Internet 103 to a digital subscriber line axis multiplexer (DSLAM) 104. The DSLAM is adapted for transmitting the data to multiple set top boxes 105, 106, which are configured as Internet group management protocol (IGMP) hosts.

[0045] Each set top box 105, 106 is for example connected to a TV 107, 110, to a telephone 108, 111 and/or to a computer 109/112.

[0046] The data transmission between the set top boxes 105, 106 and the DSLAM is performed via communication lines 114, 115, respectively.

[0047] Communication between the receiving stations 105, 106 and the transmitting station 101 may be performed bi-directionally, i.e. in the IGMP join messages directions 116 or in the forwarding multicast streams direction 117.

[0048] The idea of the technique may be better described for an IPTV system (although also applicable for radio broadcast systems), where many channels (e.g., TV, audio, EGP) can be received (although possibly not always simultaneously) at STB at viewer/listener premise.

[0049] In the IPTV network depicted in Fig. 1, comprises the STB (Set Top Box)105 at a customer premise and the TV/Audio Head End 101 that collects the channels from the different channel providers and makes them available to the viewer/listeners.

[0050] It should be noted that the middle network elements like BRAS, Ethernet switches, routers, video servers, etc, have been deliberately removed for simplicity reasons. The IGMP protocol mentioned is an example for a multicast protocol, and is a commonly used protocol. But the invention is not limited to the use of IGMP; other multicast protocols can be used instead.

[0051] Normally at start up the STB 105, 106 would tune (e.g., IGMP Join request) to the Announcements multicast channel, and then to the SW multicast channel to download and run the correct/updated STB SW. After this it may be possible for the users to select new channels or the EPG (Electronic Programming Guide) by having the STB tuning/requesting the new channel (e.g., IGMP Join request) probably by releasing (e.g., IGMP leave request) other channels first.

[0052] In the following, some basic concepts are discussed:

- Normal Channel

[0053] This is a channel coming from TV/audio producers like CNN, VH1, Sky News, TV5, etc. Such channels do exactly transmit audio/video contents unlike the virtual channel's control channel.

- Virtual Channel (VC)

[0054] Not a channel per se, but a channel that is created by the STB from the available/subscribed broadcasted "normal" channel (e.g., CNN, MTV, Discovery, History) that are timely changed over time (e.g., now CNN, then Discovery, then MTV, then probably CNN again) by the STB from the information broadcasted by a virtual channel's control channel.

[0055] The visualization of these channels thus requires the tuning of both channels, i.e., first the virtual channel's control channel and then its referenced "normal" channel which would normally change overtime.

- Virtual Channel's Control Channel (VCCC)

[0056] A special type of channel that unlike "normal" channels does not transport video/audio contends but instead only the channel reference to be viewed/listened at any given moment for that virtual channel.

[0057] This channel is also broadcasted but has a

much limited bandwidth when compared with "normal" channel, as only a channel id is broadcasted.

[0058] Such channel is produced normally but not restrict in real-time or near real-time by an external company being it a dedicated company, interest group, or individual.

[0059] As any normal channel this channel may have to be tuned (e.g., IGMP join) and may have to be subscribed, i.e., it may only be available under paid subscription.

[0060] This channel may be sent continuously but also periodically although care may have to be taken in order to have short enough periods to avoid an even later/longer channel change (e.g., movie already started for a while) which may already take a non-neglectable time depending on the channel switching time speed (e.g., IGMP join possibly after IGMP leave from previous multicast channel may not be neglected). Even if a channel change would be reported instantaneously by the external entity in the control channel a problem may still exist since that a viewer/listener upon selection of a Virtual Channel Control Channel may have to wait for a while until the channel to be set is known (due to its periodic transmission) and therefore tuned by the STB.

[0061] A VCCC may not have to be limited to the emission of a single virtual channel (VC) but many VCs may be sent at once. This is especially true for those STBs which can decode different video/audio channels simultaneously to be seen at different TV sets connected to it. It is also true for advanced TV sets or even STBs which would allow viewing different channels at once at TV screen.

[0062] Note: For easy understanding throughout the description of the invention only one VC is being referenced by a VCCC.

[0063] Below are described the properties/changes required for each of the components that make out the IP-TV.

- Additional channel type - the Virtual Channel's Control Channel

[0064] Apart from the existing channels like, Video/audio channels (possibly more than one received simultaneously), Announcements channel (controlling channel normally periodically sent), SW version (sent on start up request), and EGP channel (Electronic Programming Guide - sent on request), it is also required now to have one additional type of channel, the Virtual Channel's Control Channel:

[0065] There may be many virtual channels' control channels (e.g., one per virtual channel) each one broadcasting the reference of the current channel to be viewed/listen in accordance with the virtual channel program list subject/choice.

It may be important to mention that only the channel references are sent not the channel contents, i.e., such control channel only sends the reference(s) (i.e., an Id like number) to the channel(s) that should be viewed/listened at a given moment.

[0066] The channel number(s) to be viewed/listen at a given moment is broadcasted at the virtual channel' control channel in a real time or near real time mode, to follow the "normal" channels programs. That choice can be done either by individuals, companies or group of interest:

[0067] A specific company or group of interest, like (but not limited too):

A company dedicated to children subjects like growth, education and protection, with lots of specialist (e.g., teachers, psychologists, parents' associations ...) on that area that should find the balance between the available channels.

Companies dedicated to different age stages (child, teens, middle age, elderly)

Companies dedicated to specific professionals subjects like Financial Markets investors (looking for a mix of news, analysis, comments ...), housemaid (mixed of cooking, series, and so...)

Group if interest - environment groups, anti-violence association group, deaf/blind association groups, ...

[0068] A specific individual, call it "Individual director" - this is a more fashionable approach where the specific person's (e.g., politician, rock star, actor/actress, sportsman, ...) selection is determined and broadcasted as, for example, "The individual Y choice channel".

[0069] Note: such channel switching information may be provided indirectly by monitoring the specific person channel switching at any moment and broadcasting that channel id/reference in a virtual channel, or to be more precise, in the associated VCCC.

[0070] This means that each virtual channel's control channel may be specific to certain subjects or most likely be a generalist channel combining many specific subjects according to the zapping channel producers overall channel orientation purpose (like but not limited too):

[0071] News or its sub-division (economics, sports, war conflicts, or sudden specific news (e.g., certain place tsunami news) ...); Spots and its subdivisions (football, basketball, ...), Music and its subdivisions (e.g., classic, pop/rock, ...), Science, travel, child entertainment, Adult entertainment or its subdivisions (e.g., types of TV series, movies, etc.), Child channel (combining/mixing animated cartoons with educational programs), Fashion, Cooking, etc.

[0072] Note: this virtual channel (service) will also be seen at the EGP list and viewers/listeners might be charged too from viewing/listening it.

- Set Top Boxes (or other enhanced audio/video receiver set)-required functionality:

a) The STB has the ability to tune both the control channel and the referred normal channel(s) in parallel.
Multiple multicast channels tuning has to be supported by the STB, such that the new very low bandwidth multicast channel can be added.
The control channel tuning is the same (e.g., required IGMP join) as for any other normal channel.

b) Allow the selection of virtual channels (i.e., their control channels) by the viewers/listeners. The control channel will be selected as any other normal channel, and will be shown from the EGP channel, possibly with a specific property to clearly identify them along with other common seen channel properties shown in EGP (e.g., channel name). Those channels may also be associated with some ids (e.g., channel numbers) meaning that operator may tune them as any other normal channel.

c) STB has the ability to identify a channel as a control channel (already possible via EGP channel flags) and infer the control channel referred channel (easy to do as the channel transmission is already digital).
The STB may has to tune (e.g., IGMP join) first the multicast group of the virtual channel's control channel to infer the multicast channel reference referred by it.
Note: although the control channel information may also be send periodically, there will have to be a trade-off because the resulting switching time may increased (be delayed) too much to an unacceptable viewer/listener value.
The STB has the ability to tune or re-tune over time for the normal channel referred by the control channel.
STB may has to tune the referred channel (e.g., another IGMP join) and be ready to switch to another channel (e.g., tune the new channel probably after the release - IGMP leave - of the previous one) as time goes by.
Because the control channel reference may not be available to the viewer/listener (i.e., requires subscription not yet done), it may be possible for the operator to configure at the STB a default available/subscribed channel to be seen at such situations. Alternatively it may be configured to remain in the currently being viewed/listened channel. In such situation one could thought in a graphical indication (e.g. message text, icon) warning to the fact that it was not possible to switch to the referred virtual channel possibly due to subscription required first.
This may also be easy to implement since the switching possibility is already present via remote control and only the triggering source has to be changed (i.e., automatically from the selection in the control channel and not from the selection provided by human via remote control).

d) Addition of possible visual flag (e.g., small icon) to inform the viewer that that's a virtual channel that is being viewed/listen. This may improve user-friendliness.

e) Provide a new or reused button (or set/combination of buttons) of STB's remote control with the functionality to hold/resume from the current referred channel, so that even if the referred channel changes the STB remains tuning to the holded channel, or resume to the current control channel's referred channel otherwise.

[0073] This may allow viewers/listeners to avoid interrupting the current control channel referred channel being seen even in the situation where the referred channel changes (e.g., want to get the rest of the news/shown). After that viewer/listener could resume so that the STB tunes to the referred channel then being chosen.

[0074] Few changes may be required at the IPTV infrastructure, as the virtual channels' control channels are almost like the "normal" channels with the big exception that require much lower bandwidth since not the channel contends but their references are broadcasted.

[0075] So, on a normal operation the viewer/listener would handle the virtual channel (its control channel to be exact) as a normal channel, i.e., it may be selected/zapped like any other, but because they are virtual channels, possibly a small icon indication is provided in addition to a button in the STB remote control to hold/resume current virtual channel choice. It should be noted that the STB remote control is not restricted to one button, nor to the addition of a new button. The STB remote control may also comprise a set of buttons or a combination of buttons which have to be pressed in a special sequence for providing the above described service.

[0076] It will be the STBs that under request of such control channels would see them as special channels and handle them appropriately.

[0077] Another possible embodiment of this invention may be for RBS (Radio Broadcast Systems) and not only for IPTV systems.

[0078] There would be also radio control channels i.e., channels stripped of their audio contents but not of the RDS (Radio Data System) part which allows digital information transmission very useful to inform the radio system receptor of the channel that should be tuned at any given moment apart from other properties of the channel, like its type, name and so on.

[0079] The tuning of those radio control channels would be exactly equal to any "normal" radio channel tuning apart from the fact that the listeners would be able

to clearly identify the channel type from the displayed RDS info that it is a virtual channel (possibly simply by a symbol representation).

[0080] Similarly to the IPTV control channels, the radio control channels may use also very little bandwidth meaning that much higher choices could be possible. And similarly to IPTV systems, case the control channel referenced channel is not available (e.g., very low signal) the system could instead switch to a preconfigured one (e.g., remain in current channel, switch to next channel with similar program, etc.)

[0081] Since in RBS the radio stations channels are not subscribed/paid by the listener (in IPTV systems they could be), a possible alternative revenue income for the radio control channels producers could be temporary and periodically switching to radio channels under commercial break or even to a permanent all-time advertisement channel that is used by the different radio control channel producers. This way those producers could assure some income for their control channels from the advertisement channel.

[0082] Thus, a support of virtual channels may be provided, which result from a timely change of "normal" available/subscribed broadcasted channels, following a certain generalist or more specific subject and whose program/channel choice is produced by an external entity normally but not restricted to in real or near real time.

[0083] An exemplary embodiment of the invention may provide the following advantages:

[0084] Provision of a creation of a virtual channel from the concatenation of programs from existing channels, by automatically switching between programs of the different channels over the time.

[0085] This feature may be attractive to viewer/listeners since it may provide the possibility to automatically switch channels according to the choices of an entrusted external source, that follows they interests/preferences and that they have explicitly allowed/requested.

[0086] Viewer/listener gain is obtained not only from having the virtual channel that could be produced by specialists (e.g., the child education and development channel, Financial Markets review channel, ...) but also in cases where the subscriber cannot constantly switch the channels or where the switching by a third person (external entity) does not lead to missing consensus when various viewers/listeners at the same receptor (e.g., TV/audio radio set).

[0087] Provision of an attractive feature that adds value to IPTV solution provider, to the virtual channels' control channels providers (both for IPTV and RDS) but also to the equipment manufactures (both for IPTV and Radio systems) supporting it.

[0088] Furthermore, user subscription to those IPTV virtual channels (i.e., to their control channels) may not be free but a paid service, meaning that both IPTV providers and the virtual channels' control channels producers (being those individuals, companies or groups of interest) may have revenue coming from them.

[0089] The method of the invention may lead viewer to subscribe to additional channels which is also attractive to the IPTV providers and TV/Audio producers. E.g., the viewer/listener may opt to subscribe to a channel that is often referenced by the virtual channel.

[0090] Unlike existing functionality, this technique may provide a much bigger virtual channel selection possibility to the viewer/listeners, coming from different external sources, instead of relying on the previous learned or configured preferences and publicized individual normal channel information to base the switching which comes as a suggestion to switch that requires also much interaction from the viewer/listener.

[0091] This technique may also avoid the existing of virtual channels which really carry video/audio contents from normal channels, not only because it means much less bandwidth requirements (hence much more virtual channels possible and less network bandwidth requirements needed) but because such approach brings less legal issues as only external entities' choices are broadcasted and not the video/audio contents of the normal channels.

[0092] Fig. 2 shows a schematic representation of a communication system according to an exemplary embodiment of the present invention which is adapted for implementing a method according to the invention. The communication system comprises a receiving station 105 and a transmitting station 101, which are linked by a communication path 201, which may be bidirectional.

[0093] Fig. 3 shows a flow-chart of an exemplary embodiment of a method according to the present invention. In step 1, a virtual channel control channel is generated by an external entity. The virtual channel control channel comprises information about normal channels, such as channel IDs or channel references. In step 2, the virtual channel control channel information is transmitted from the transmitting unit to a receiving unit, for example via triple-play provider network or even via Internet. Then, in step 3, the virtual channel control channel information is received by the receiving station, for example after switching on a set top box at the receiving station and after switching the receiving station to an electronic program guide showing different categories and after selecting the virtual channel control channel.

[0094] Then, in step 4, the virtual channel control channel is identified by the receiving station and for example tagged in order to show the user, that this channel is a virtual channel or virtual channel control channel. Then, in step 5, the receiving station switches automatically to the normal channel corresponding to the virtual channel control channel information. If the user wants, he/she can press a hold button in order to keep this selected channel which is now proposed. After that, the user may press a "resume button" to continue the channel selection triggered by the external entity.

[0095] Advantageously, by selecting the normal channel to be viewed, listened to, the external entity may be in the position to catch the start/end of a program and to

avoid commercials, even if programs are shifted in time due to program changes.

[0096] It should be noted that the term "comprising" does not exclude other elements or steps and the "a" or "an" does not exclude a plurality. Also elements described in association with different embodiments may be combined.

[0097] It should also be noted that reference signs in the claims shall not be construed as limiting the scope of the claims.

Glossary

[0098]

BRAS - Broadband Remote Access Server
DSLAM - Digital Subscriber Line Access Multiplexer
IGMP - Internet Group Management Protocol
IP - Internet Protocol
IPTV - IP TV
NE - Network Node
RBS - Radio Broadcast System
RDS - Radio Data System
STB - Set Top Box
VC - Virtual Channel
VCCC - Virtual Channel's Control Channel

Claims

1. Method for providing a virtual channel for a receiving station, the method comprising the steps of:

receiving information from a virtual channel control channel in the receiving station;
automatically switching to a normal channel on the basis of the information from the virtual channel control channel;

wherein the information comprises a channel reference corresponding to a normal channel; and
wherein the information is transmitted from a transmitting station to the receiving station via the virtual channel control channel.

2. The method of claim 1,
wherein the receiving station comprises at least one of a television apparatus for visualizing television programs, a set top box, a radio apparatus for playing an analogue radio broadcast, and a radio apparatus for playing a radio digital broadcast.

3. The method of one of claims 1 or 2,
wherein the information transmitted in the virtual channel control channel is generated by an external entity selected from the group comprising a dedicated company, an interest group, and an individual.

4. The method of one of the preceding claims,
wherein the virtual channel control channel is transmitted continuously or periodically, such that the automatic switching to the normal channel can be performed in real time, near real time or non-real time.

5. The method of one of the preceding claims,
wherein the receiving station is adapted for recognizing the virtual channel control channel as a special channel which differs from a normal channel.

6. The method of one of the preceding claims,
wherein the virtual channel control channel comprises a plurality of individual channel references, each corresponding to a respective normal channel.

7. The method of one of the preceding claims,
wherein the receiving station allows for a selection of the virtual channel control channel by a user.

8. The method of one of the preceding claims,
wherein the receiving station is adapted for tuning both the virtual channel control channel and the normal channel.

9. Receiving station for providing a virtual channel, the receiving station being adapted for:

receiving information from a virtual channel control channel;
automatically switching to a normal channel on the basis of the information from the virtual channel control channel;

wherein the information comprises a channel reference corresponding to a normal channel; and
wherein the information is transmitted from a transmitting station to the receiving station via the virtual channel control channel.

10. The receiving station of claim 9, adapted for identifying the virtual channel control channel.

11. Communication system for providing a virtual channel, the communication system comprising a transmitting station and a receiving station,
wherein the transmitting station is adapted for transmitting information via a virtual channel control channel, the information comprising a channel reference corresponding to a normal channel to the receiving station;
wherein the receiving station is adapted for:

receiving the information from the virtual channel control channel; and
automatically switching to a normal channel on the basis of the information from the virtual channel control channel.

FIG 1

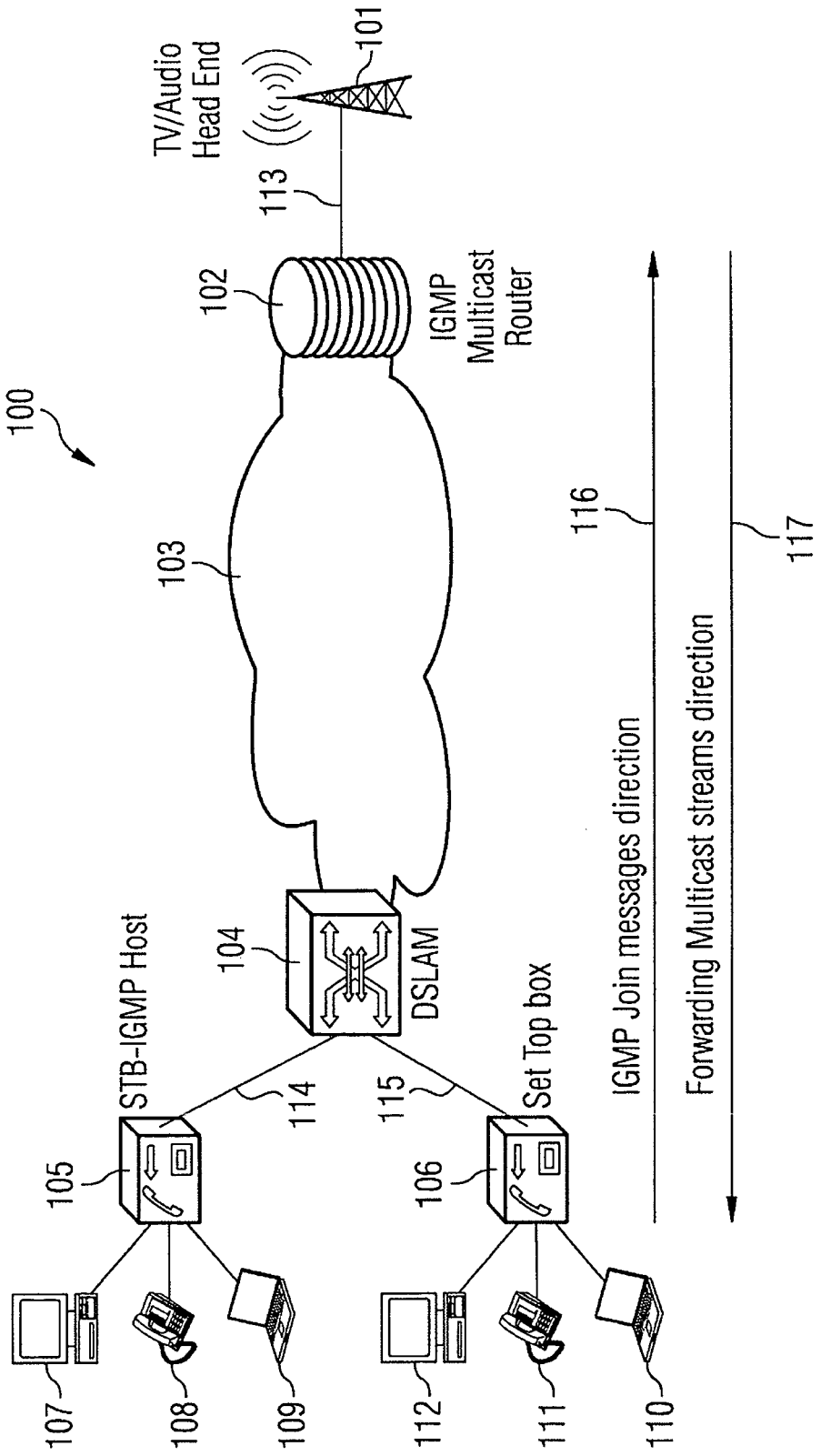

100
101
TV/Audio Head End
113
102
IGMP Multicast Router
103
104
DSLAM
STB-IGMP Host
Set Top box
105
106
114
115
116
117
IGMP Join messages direction
Forwarding Multicast streams direction
107
108
109
112
111
110

FIG 2

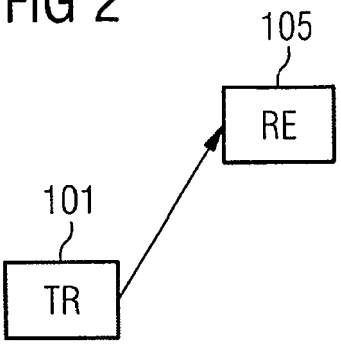
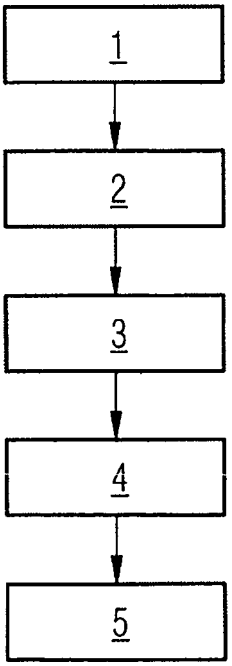


FIG 3



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EUROPEAN SEARCH REPORT

Application Number
EP 07 01 7325

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 359 601 A (WASILEWSKI ANTHONY J [US] ET AL) 25 October 1994 (1994-10-25) * column 1, lines 17-19 * * column 5, lines 34-37 * * column 6, lines 17-23 * * column 7, lines 10-19 * * column 7, lines 35-39 * * column 7, lines 44-48 * * column 10, lines 59-63 * * column 11, lines 1-21 * * column 11, lines 38-41 * * column 11, line 57 - column 12, line 3; figures 3,10 * -----	1-11	INV. H04H20/10
			TECHNICAL FIELDS SEARCHED (IPC)
			H04H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 June 2008	Pantelakis, P

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30-06-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5359601 A	25-10-1994	US 5418782 A	23-05-1995

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82