METHOD FOR IMPLEMENTING FAST-DYNAMIC CHANNEL ALLOCATION RADIO RESOURCE MANAGEMENT PROCEDURES

A method of optimizing a fast dynamic channel allocation radio resource management algorithm in a wireless communication system includes a pre-code allocation process, a signal-independent code allocation process, and a post-code allocation process. The pre-code allocation process includes receiving and processing an input message and obtaining system measurements and information from a centralized database. The code allocation process begins by checking the availability of a code set in the cell and generating timeslot sequences for the available timeslots. A code set is assigned to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution. The interference signal code power (ISCP) is calculated for each solution and the solution having the lowest weighted ISCP is selected as an optimal solution. The post-code allocation process includes storing allocation information in a centralized database and creating an output message.
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[0001] METHOD FOR IMPLEMENTING FAST-DYNAMIC CHANNEL ALLOCATION RADIO RESOURCE MANAGEMENT PROCEDURES

[0002] FIELD OF THE INVENTION
[0003] The present invention relates generally to radio resource management in wireless communication systems, and more particularly to implementations of fast dynamic channel allocation (F-DCA) radio resource management (RRM) procedures.

[0004] BACKGROUND OF THE INVENTION
[0005] In wireless communication systems, RRM is generally responsible for utilizing the air interface resources. RRM is used to guarantee quality of service (QoS), to provide efficient use of the radio resources, and to increase system capacity. RRM consists of admission control, handover, power control, and congestion control functionalities. Admission control can be divided into user admission control and call admission control (CAC). User admission control accepts or rejects the radio resource control (RRC) connection requested by a wireless transmit/receive unit (WTRU). Call admission control accepts or rejects a request to establish or modify a radio access bearer (RAB) in the radio access network (RAN). Call admission control is located in the controlling radio network controller (C-RNC).

[0006] There are two dynamic channel allocation (DCA) functions, slow DCA and fast DCA (S-DCA, F-DCA). The S-DCA allocates the radio resources to cells while the F-DCA allocates the radio resources to bearer service. The F-DCA call admission control functions are responsible for efficiently allocating or changing the allocations of physical resources. When a request for physical resources is received, the call admission control will accept or reject the request based on the availability of physical resources and interference level in the cell. The request can be accepted only if both uplink and downlink call admission control admit it. Otherwise, the request is rejected.

[0007] In order to guarantee the QoS and minimize the interference, a certain F-DCA call admission control algorithm is currently implemented. But
the previous implementation of the F-DCA call admission control algorithm has several limitations. One limitation is that it is difficult to be reused by other RRM functions since the main interface function is large and the inputs to the code allocation function (which forms the core function of the F-DCA call admission control algorithm) are dependent on the signal message. A second limitation is that the past implementation of the F-DCA CAC algorithm is generally only suitable for real time (RT) service.

[0008] Two F-DCA functions, which could be in the form of algorithms, are executed by RRM at steady state operation: one for background interference reduction and one for an escape mechanism.

[0009] The F-DCA background interference reduction procedure is used to keep WTRU and system resource usage at a reasonable level at all times by reassigning radio resources (timeslots and codes) to an existing radio bearer. The F-DCA background interference reduction procedure is triggered by RRM periodically. The period to trigger the background interference reduction procedure is a design parameter; in a preferred embodiment of the present invention, the period is two seconds. It has relatively low priority among the three F-DCA algorithms.

[0010] The F-DCA escape mechanism is used to solve a link problem of a user. It is used as an escape mechanism for a specific user (or part of user services) or a base station that experiences high interference or that cannot satisfy QoS by reassigning the radio resources to an existing radio bearer. The F-DCA escape mechanism runs in a cell for all WTRUs in steady state with real time (RT) services. It does not apply to non-real time (NRT) services.

[0011] Only one F-DCA function is preferably run at a given time in a C-RNC, because the output of one function may affect the decision of another function. If more than one of these functions are triggered at exactly the same time, the priority of these functions is such that the escape procedure runs first, call admission control runs second, and the background interference reduction procedure runs last.

[0012] Handover is used to switch a radio link from one cell to another without interruption of the call in order to maintain the required QoS. The
radio link addition procedure is used to establish physical resources for a new radio link in a Node B for which a WTRU already has a communication context when a handover is taking place.

[0013] For time division duplex (TDD) mode, the radio link setup procedure is used to establish the necessary radio resources for a new radio link related to real time (RT) or non-real time (NRT) services. After the radio link is set up, the radio link reconfiguration procedure is used to add, modify, or delete any physical resources for this existing radio link. The F-DCA CAC algorithm is invoked upon receiving the request messages.

[0014] It is desirable to provide an optimized implementation of the F-DCA CAC algorithm which is suitable for RT and NRT services, and which overcomes the disadvantages of the known algorithms. It is also desirable to provide an improved escape mechanism and an implementation of the background interference reduction procedure, both of which satisfy the foregoing requirements. It is further desirable to provide an optimized implementation of the F-DCA CAC algorithm for radio link addition and radio link reconfiguration, which are suitable for RT and NRT service, and which overcome the disadvantages of the known algorithms.

[0015] SUMMARY OF THE INVENTION

[0016] The present invention improves and optimizes the known F-DCA algorithm implementations by modularizing/categorizing the functionality of the F-DCA algorithms and making the inputs to the core channel allocation function of these algorithms independent of signal messages. More specifically, certain functions in the previous implementation of the F-DCA CAC algorithm that are signal-dependent are altered to become signal-independent by the present invention, such that the altered functions are reusable in the implementation of the escape mechanism. The invention is described in the context of layer 3 in TDD scenario, but is applicable without limitation to other modes of transmission as well.

[0017] The ongoing development of third generation wireless telecommunication systems requires new and efficient radio resource
management. The present invention provides an optimization to the implementations of the F-DCA algorithms in RRM. The inventive method modularizes and modifies the implementation of F-DCA algorithms into three processes: pre-code allocation, code allocation, and post-code allocation. The functions in both the pre-code allocation process and the post-code allocation process are signal-dependent, while the functions in code allocation process are signal-independent. The pre-code allocation process is used to describe how and where to retrieve the information from the input message and databases, and how to prepare the required inputs for the code allocation process. The post-code allocation process is used to determine what information should be stored in the databases, and what information should be provided to the output message. The modularized functions of the present invention can be reused by other RRM algorithms in both RT service and NRT service.

[0018] The present invention provides an implementation of the F-DCA CAC algorithm for radio link setup procedure in RRM. A method of optimizing a F-DCA CAC algorithm in a wireless communication system includes a pre-code allocation process, a signal-independent code allocation process, and a post-code allocation process. The pre-code allocation process includes receiving and processing a request message and obtaining system measurements and information from a centralized database. The code allocation process begins by checking the availability of codes in the cell and generating timeslot sequences for the available timeslots. A code set is assigned to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution. The interference signal code power (ISCP) is calculated for each solution and the solution having the lowest weighted ISCP is selected as an optimal solution. The post-code allocation process includes storing allocation information in a centralized database and creating a response message.

[0019] A method for a F-DCA CAC in a wireless communication system begins by receiving and processing a request message to initiate the CAC function. Node B measurements, a list of available timeslots, and a list of code sets are retrieved from a centralized database. A set of codes is allocated to the
available timeslots and the allocation information is stored in the centralized database. A response message is sent with the results of the code allocation process.

[0020] The present invention provides a method for implementing the F-DCA escape mechanism in RRM, which increases system efficiency by functioning as follows. The F-DCA escape mechanism is triggered by RRM for a specific uplink or downlink coded composite transport channel (CCTrCH) of a WTRU when one of the following three conditions is met:

[0021] 1) The downlink (DL) timeslot ISCP measured by a WTRU is greater than a threshold.

[0022] 2) The uplink (UL) timeslot ISCP measured by a Node B is greater than a threshold. These two thresholds are design parameters, and can be the same value or can be different values.

[0023] 3) The Node B reaches the maximum allowed transmitted power.

[0024] A method of implementing a F-DCA escape procedure in a wireless communication system includes a pre-code allocation procedure, a signal-independent code allocation procedure, and a post-code allocation procedure. The pre-code allocation procedure receives a trigger signal, obtains WTRU measurements and Node B measurements from an RRC shared cell database, obtains cell configuration information and WTRU information from a centralized database, determines the candidate CCTrCH to be reassigned, and determines the candidate code set to be reassigned. The code allocation procedure checks the code availability in the cell, checks the transmitted power of the candidate timeslot, checks if the ISCP of other timeslots is lower than that of the candidate timeslot, generates timeslot sequences for the available timeslots, assigns the candidate code set to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution; calculates an ISCP for each solution; and selects the solution having the lowest weighted ISCP as an optimal solution. The post-code allocation procedure stores the reallocation information in the centralized database and creates a physical channel reconfiguration request message.
[0025] A method of implementing a F-DCA escape mechanism in a wireless communication system begins by receiving and processing a trigger signal. WTRU and Node B measurements are retrieved from a centralized database and physical resources to be reassigned are determined. A code set is allocated to the available timeslots and the allocation information is stored in the centralized database. A physical channel reconfiguration request message is sent, containing the new allocation information for this WTRU.

[0026] The present invention provides a method for implementing the F-DCA background interference reduction procedure in RRM. A method of implementing a F-DCA background interference reduction procedure in a wireless communication system includes a pre-code allocation procedure, a signal-independent code allocation procedure, and a post-code allocation procedure. The pre-code allocation procedure receives a background timer trigger signal; obtains both WTRU and Node B measurements from an RRC shared cell database; obtains both cell and WTRU information from a centralized database; determines the candidate timeslots (one for the uplink direction and one for the downlink direction) to be reassigned; retrieves a list of the available timeslots to be used for reassignment from a centralized database; and determines the candidate code sets to be reassigned. The code allocation procedure checks the availability of a code set in the cell; checks the transmission power of a candidate timeslot; generates timeslot sequences for the available timeslots; assigns a code set to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution; calculates an ISCP for each solution; and selects the solution having the lowest weighted ISCP as an optimal solution. The post-code allocation procedure stores the reallocation information in the centralized database and creates a physical channel reconfiguration request message.

[0027] A method of implementing a F-DCA background interference reduction procedure in a wireless communication system includes a pre-code allocation process, a signal-independent code allocation process, and a post-code allocation process. The pre-code allocation process begins by receiving a timer trigger signal. System measurements are retrieved from a centralized
database. The physical resources to be reassigned are determined based on a figure of merit. The code allocation process begins by checking the availability of a code set in the cell and generating timeslot sequences for the available timeslots. A code set is allocated to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution. The ISCP is calculated for each solution and the solution having the lowest weighted ISCP is selected as an optimal solution. The reallocation information is stored in the centralized database. A physical channel reconfiguration request message is sent, containing the allocation information.

[0028] The present invention provides an implementation of the F-DCA CAC algorithm for radio link addition procedure in RRM. A method of implementing F-DCA CAC algorithm for radio link addition in a wireless communication system includes a pre-code allocation process, a signal-independent code allocation process, and a post-code allocation process. The pre-code allocation process includes receiving and processing a radio link addition request message, and retrieving system information from a centralized database. The code allocation process includes checking the availability of a code set in the cell; generating timeslot sequences; assigning a code set to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution; calculating ISCP for each solution; and selecting the solution having the lowest weighted ISCP as an optimal solution. The post-code allocation process includes storing allocation information in the centralized database and creating a radio link addition response message.

[0029] A method of implementing F-DCA CAC algorithm for radio link addition in a wireless communication system begins by receiving a radio link addition request message to initiate the CAC function. The request message is processed and a list of available timeslots and a list of code sets are retrieved from a centralized database. The code sets are allocated to the available timeslots in the new cell, and the allocation information is stored in the centralized database. A radio link addition response message is then sent with the results of the code allocation process.
[0030] The present invention provides an implementation of the F-DCA CAC algorithm for radio link reconfiguration procedure in RRM. A method of implementing F-DCA CAC for radio link reconfiguration in a wireless communication system includes a pre-code allocation process, a signal-independent code allocation process, and a post-code allocation process. The pre-code allocation process includes receiving and processing a request message, and retrieving system information from a centralized database. The code allocation process includes checking the availability of a code set in the cell; generating timeslot sequences; assigning a code set to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution; calculating the ISCP for each solution; and selecting the solution having the lowest weighted ISCP as an optimal solution. The post-code allocation process includes storing allocation information in a centralized database and creating a response message.

[0031] A method for F-DCA CAC for radio link reconfiguration in a wireless communication system begins by receiving a request message to initiate the CAC function. The request message is processed and a list of available timeslots and a list of code sets is retrieved from a centralized database. The code sets are allocated to the available timeslots and the allocation information is stored in the centralized database. A response message with the results of the code allocation process is then sent.

[0032] BRIEF DESCRIPTION OF THE DRAWINGS

[0033] A more detailed understanding of the invention may be had from the following description of a preferred embodiment, given by way of example, and to be understood in conjunction with the accompanying drawings wherein:

[0034] Figure 1 is an overview of the F-DCA CAC algorithm for radio link setup;

[0035] Figures 2a-2c are flowcharts of the F-DCA CAC algorithm for radio link setup shown in Figure 1;

[0036] Figures 3a and 3b are flowcharts for the channel allocation function for the F-DCA CAC algorithm shown in Figure 2;
[0037] Figure 4 is an overview of a F-DCA escape procedure in accordance with the present invention;

[0038] Figures 5a and 5b show a flowchart of the F-DCA escape procedure shown in Figure 4;

[0039] Figure 6 shows the first part a flowchart for the channel allocation function for the F-DCA escape procedure shown in Figures 5a and 5b;

[0040] Figure 7 is an overview of a F-DCA background interference reduction procedure in accordance with the present invention;

[0041] Figures 8a and 8b show flowcharts of the F-DCA background interference reduction procedure shown in Figure 7;

[0042] Figure 9 is an overview of a F-DCA CAC procedure for radio link addition in accordance with the present invention;

[0043] Figures 10a-10c are flowcharts of the F-DCA CAC procedure shown in Figure 9;

[0044] Figure 11 is an overview of a F-DCA CAC procedure for radio link reconfiguration in accordance with the present invention;

[0045] Figure 12 is a flowchart of the F-DCA CAC procedure for radio link reconfiguration shown in Figure 11; and

[0046] Figures 13a-13c are flowcharts of a physical channel allocation procedure of the F-DCA CAC procedure for radio link reconfiguration shown in Figure 12.

[0047] DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0048] Call Admission Control for Radio Link Setup

[0049] An overview 100 of the F-DCA CAC algorithm for radio link setup procedure 102 is shown in Figure 1. The main function of the F-DCA CAC algorithm 102 consists of three parts: the pre-code allocation process 104, the code allocation process 106, and the post-code allocation process 108. The pre-code allocation process 104 reads WTRU measurements from radio link setup request message 110 and Node B measurements from the RRC shared cell database 112 and prepares the inputs (a list of available timeslots from the
RRM cell database 116 and a list of code sets from the operations and maintenance (OAM) RRM table database 114 for the code allocation.

[0050] The code allocation process 106 checks the code availability in the cell, generates timeslot sequences, finds the optimal solution for the code set (assigns the codes in the code set to the available timeslots), and allocates the channelized codes from the code vectors in a RRM cell database 116. The post-code allocation process 108 is responsible for creating a WTRU entity in a RRM WTRU database 118, recording the allocated physical channels in the RRM WTRU database 118, recording the physical channel parameters and power control information in the radio link setup response message 120.

[0051] In addition to the data exchanges between the processes and the databases, there are data exchanges occurring directly between the processes. The WTRU measurements, the Node B measurements, a list of the available timeslots in the cell, a list of code sets for the specific data rate, and WTRU capability information are passed from the pre-code allocation process 104 to the code allocation process 106. The physical channel information (a list of timeslots and channelized codes in each timeslot) are passed from the code allocation process 106 to the post-code allocation process 108.

[0052] In the present invention, the functions of the F-DCA CAC algorithm for radio link setup procedure 102 are modularized into two groups of functions: signal-dependent functions whose inputs are parts of signal messages and signal-independent functions whose inputs are independent of signal messages. The purpose of separating the signal-dependent functions and the signal-independent functions is to increase the reusability of the signal-independent functions. The functions of both the pre-code allocation process 104 and the post-code allocation process 108 are signal-dependent functions. In contrast, the functions of the code allocation process 106 are signal-independent functions. It is to be noted that the functions of the code allocation process 106 can be reused by other procedures in other RRM function implementations, such as handover, F-DCA escape algorithm, and F-DCA background interference reduction algorithm.
The flowcharts for functions of the F-DCA CAC algorithm for radio link setup are shown in Figures 2a-2c and 3a-3b. Figures 2a-2c show the main interface function 200 of the F-DCA CAC algorithm for radio link (RL) setup. The function 200 begins by obtaining the RL setup request message (referred to hereinafter as “request message”; step 202) and extracting parameters from the request message (step 204). The request message contains coded composite transport channel (CCTrCH) information, dedicated channel (DCH) information, RL information with or without WTRU measurements, and WTRU capability information. The parameters extracted from the request message include information such as the WTRU identification, the cell identification, the RL identification, and WTRU capability information (the maximum number of physical channels per timeslot and the maximum number of timeslots per frame).

The entry identification of the RRM cell database is obtained (step 206). Next, a determination is made whether the WTRU measurements, which include the downlink interference signal code power (DL ISCP), are included in the request message (step 208). If the WTRU measurements are not included in the request message, then a check is made to determine whether all of the DCHs are non-real time (NRT; steps 210 and 212). If all the DCHs are not NRT, then a status flag is set to indicate a failure condition (step 214) and the function terminates (step 216). The failure condition means that there are no physical resources available for the WTRU. It is noted that all DCHs not being NRT alone is not a failure condition. The failure condition is reached when there are no WTRU measurements and all the DCHs are not NRT.

If all the DCHs are NRT (step 212), then the low rate temporary DCHs are allocated for the present CCTrCH (step 218). After the channels are allocated, a determination is made whether the resource allocation was successful (step 220). If the resource allocation was not successful, then the status flag is set to indicate a failure condition (step 214) and the function terminates (step 216). If the resource allocation was successful (step 220), then a WTRU entity is created and the WTRU information and the physical channel parameters are recorded in the RRM WTRU database (step 222). The
information recorded to a WTRU entity includes the WTRU identification, the transaction identification, the uplink (UL) WTRU capability information, the DL WTRU capability information, and the RL information. The UL WTRU capability information includes the maximum number of timeslots per frame and the maximum number of UL physical channels per timeslot. The DL WTRU capability information includes the maximum number of timeslots per frame and the maximum number of DL physical channels per frame. The RL information includes the RL identification, the cell identification, the UL CCTrCH information, and the DL CCTrCH information. The CCTrCH information includes the CCTrCH identification, the CCTrCH status, the CCTrCH signal to interference ratio (SIR) target, the guaranteed data rate, the allowed data rate, and the dedicated physical channel (DPCH) information. The DPCH information includes a list of timeslots, the midamble shift and burst type, the transport format code indicator (TFCI) presence, and the code information. The code information includes the channelized code, the code usage status, the DPCH identification, and the code SIR target.

[0056] Next, the physical channel information and power control information is placed into a RL setup response message (step 224), the status flag is set to indicate a success condition (step 226), and the function terminates (step 216). The physical channel information includes a list of timeslots and the channelized codes in each timeslot. The timeslot information includes a repetition period and a repetition length. The power control information includes the UL target SIR, the maximum UL SIR, the minimum UL SIR, the initial DL transmission power, the minimum DL transmission power, and the maximum allowed UL transmission power. In one implementation of the present invention, a single data structure is used for both the request message and the response message since these two messages include a large amount of common information.

[0057] If the WTRU measurements are available in the request message (step 208), then the WTRU measurements are retrieved from the request message and Node B measurements are obtained from the RRC shared cell database (step 228). The Node B measurements include common
measurements and dedicated measurements. The Node B common measurements include the UL ISCP and the DL transmitted carrier power. The Node B dedicated measurements include the DL transmitted code power. The first DL CCTrCH is selected (step 230) and the service type for the selected CCTrCH is obtained (step 232). If the service type is real time (RT; step 234), the available timeslots in the cell are determined (step 236). If no timeslots are available (step 238), the status flag is set to indicate a failure condition (step 214) and the function terminates (step 216).

[0058] If there are timeslots available (step 238), then the requested data rate is calculated (step 240). The code sets for the calculated data rate are obtained (step 242) and the physical channels (timeslots and codes) for the present CCTrCH are allocated and the optimal solution is recorded if found (step 244). The allocation function in step 244 is discussed in greater detail below in connection with Figures 3a and 3b. If the resource allocation was not successful (step 246), then the status flag is set to indicate a failure condition (step 214) and the function terminates (step 216).

[0059] If the resource allocation was successful (step 246), then a determination is made whether there are additional CCTrCHs to be examined (step 248). If there are additional CCTrCHs to be examined, then the next CCTrCH is selected (step 250) and the function continues at step 232. If there are no additional CCTrCHs to be examined (step 248), then a determination is made whether the UL CCTrCHs have been examined (step 252). If the UL CCTrCHs have not been examined, then the first UL CCTrCH is selected (step 254) and the function continues at step 232. If all of the UL CCTrCHs have been considered (step 252), then the function continues at step 222, as described above.

[0060] If the service type is NRT (step 234), the available timeslots in the cell are determined (step 256). If no timeslots are available (step 258), the status flag is set to indicate a failure condition (step 214) and the function terminates (step 216).

[0061] If there are timeslots available (step 258), then all data rates suitable for the NRT service are determined (step 260) and the highest data rate is
selected (step 262). The code sets for the selected data rate are obtained (step 264) and the normal temporary DCHs for the present CCTrCH are allocated and the optimal solution is recorded if found (step 266). It is noted that steps 244 and 266 are essentially the same; in NRT service, the DCHs are temporary.

[0062] If the resource allocation was not successful (step 268), then a determination is made whether there are additional data rates to be examined (step 270). If there are no other data rates to be examined, then the status flag is set to indicate a failure condition (step 214) and the function terminates (step 216). If there are other data rates to be examined (step 270), then the next highest data rate is selected (step 272) and the function continues at step 264. If the resource allocation was successful (step 268), then the function continues at step 248 as described above.

[0063] It is noted that in connection with steps 230, 252, and 254 that either direction (DL or UL) can be performed first. As described above, the DL direction is examined prior to the UL direction. The function 200 will operate in the same manner if instead the UL was examined prior to the DL.

[0064] The steps 244 and 266 relate to calling the core function of the F-DCA algorithms to allocate the physical channels. This core function 300 is signal-independent and is described in connection with Figures 3a and 3b. The function 300 begins by receiving the code sets and the available timeslots as inputs (step 302). The first code set is selected (step 304) and a determination is made whether the code set is available in the cell (steps 306 and 308). If the selected code set is not available in the cell, then a determination is made whether there are more code sets to be examined (step 310). If there are more code sets, then the next code set is selected (step 312) and the function continues with step 306. If there are no more code sets, this indicates a failure condition, and a status flag is set to indicate that no solution is available (step 314) and the function terminates (step 316).

[0065] If the selected code set is available in the cell (step 308), then the required resource units for the code set in the CCTrCH are calculated (step 318). The timeslot sequences are generated (step 320) and the first timeslot...
sequence is selected (step 322). The link direction, either DL or UL, is then determined (step 350). If the link direction is DL, then an attempt is made to assign the current DL code set into the available timeslots in the current timeslot sequence (step 352). If the link direction is UL (step 350), then an attempt is made to assign the current UL code set into the available timeslots in the current timeslot sequence (step 354). In an alternate embodiment of the present invention (not shown), step 350 can be eliminated and steps 352 and 354 can be combined into a single step, to provide additional optimization.

[0066] After an attempt has been made to assign the current code set to the available timeslots in the current timeslot sequence (steps 352, 354), a determination is made whether an assignment solution has been found (step 356), indicating that the code set was successfully assigned to the available timeslots in the current timeslot sequence. If a solution has been found, then the ISCP of the solution is determined, and the solution having the lowest weighted ISCP is considered to be the optimal solution and is recorded (step 358). If no solution was found (step 356), then step 358 is skipped.

[0067] Next, a determination is made whether there are any additional timeslot sequences to be considered (step 360). If there are additional timeslot sequences, then the next timeslot sequence is selected (step 362) and the function continues with step 350. If there are no additional timeslot sequences (step 360), then a determination is made whether an optimal solution has been found (step 364). If no optimal solution has been found, then the function continues at point C in the calling function (i.e., the function from which step 350 was entered). If the optimal solution has been found, then the status flag is set to indicate a successful assignment (step 366) and the function terminates (step 316).

[0068] In past implementations of the F-DCA CAC algorithm, the functions 352 and 354 are signal-dependent. In the present invention, these two functions are modified to become signal-independent functions. All related functions used in these two functions are also modified to become signal-independent functions. Because the inputs of the functions 352, 354 are independent of the signal message (such as the input message), the functions
352, 354 can be used by other RRM procedures. It is noted that the above-described implementation of the F-DCA CAC algorithm is exemplary and can be further optimized.

[0069] Escape

[0070] An overview 400 of the F-DCA escape procedure 402 is shown in Figure 4. The main function of the F-DCA escape procedure 402 consists of three parts: the pre-code allocation process 404, the code allocation process 406, and the post-code allocation process 408. The pre-code allocation process 404 is started upon receipt of a measurement trigger signal 410. There are two measurement trigger signals, a WTRU measurement trigger signal and a Node B measurement trigger signal. The WTRU measurement trigger signal contains the WTRU identification and a list of timeslot numbers, while the Node B measurement trigger signal contains a timeslot number. The escape procedure begins upon receipt of either the WTRU measurement trigger signal or the Node B measurement trigger signal.

[0071] The pre-code allocation process 404 gets Node B measurements and WTRU measurements from a RRC shared cell database 412, gets cell configuration information from a RRM cell database 416, obtains WTRU capability information from a RRM WTRU database 418, determines the CCTrCH to be reassigned, calculates the WTRU pathloss, determines the candidate code set to be reassigned, and obtains a list of the available timeslots. The pre-code allocation process 404 prepares the inputs for the code allocation process 406.

[0072] The code allocation process 406 checks the code availability in the cell, checks the transmission (Tx) power of the candidate timeslot, checks if the ISCP of other timeslots is lower than that of the candidate timeslot, generates timeslot sequences for the available timeslots, finds the assignment solution for the code set in a timeslot sequence (by assigning the candidate code set to the available timeslots), and selects the solution that has the lowest weighted ISCP as the optimal solution. The post-code allocation process 408 is responsible for recording the newly allocated physical channels in the
RRM WTRU database 418 and filling the physical channel information into a physical channel reconfiguration request message 420.

[0073] In addition to the data exchanges between the processes and the databases, there are data exchanges occurring directly between the processes. The WTRU measurements, the Node B measurements, a list of available timeslots in the cell, a candidate code set, and WTRU capability information are passed from the pre-code allocation process 404 to the code allocation process 406. The physical channel information (a list of timeslots and channelized codes in each timeslot) are passed from the code allocation process 406 to the post-code allocation process 408.

[0074] In the present invention, the functions of the F-DCA escape algorithm 402 are modularized into two groups of functions: signal-dependent functions whose inputs are parts of signal messages and signal-independent functions whose inputs are independent of signal messages. The purpose of separating the signal-dependent functions and the signal-independent functions is to increase the reusability of the signal-independent functions. The functions of both the pre-code allocation process 404 and the post-code allocation process 408 are signal-dependent functions. In contrast, the functions of the code allocation process 406 are signal-independent functions. Therefore, the reusability of signal-independent functions is higher than that of the signal-dependent functions. Certain functions, which are inherently signal-dependent, are converted in the preferred embodiment of the present invention from being signal-dependent to signal-independent, thereby increasing the reusability of the converted functions.

[0075] The flowcharts for functions of the F-DCA escape procedure are shown in Figures 5a, 5b, and 6. Figures 5a and 5b show flowcharts of the main escape algorithm 500, which begins by receiving inputs from the trigger signals (step 502). The entry identification of the RRM cell database is retrieved from the RRM cell database (step 504). The WTRU measurements and the Node B measurements are retrieved from the shared cell database (step 506). The link direction of the timeslots that have a link problem is
determined (step 508) and the timeslot that has the worst link problem is located.

[0076] A candidate CCTRCH to be reassigned is determined based on how the escape mechanism is triggered (step 510). When the escape procedure is triggered by a too high DL ISCP of a WTRU in a timeslot, the CCTrCH of the WTRU in this timeslot is the candidate to be reassigned. The DL ISCP is measured by the WTRU, and in this case, the escape procedure is triggered by the WTRU measurement signal.

[0077] When the escape procedure is triggered by a too high UL ISCP in a timeslot, the CCTrCH that has the code with the highest value of SIR plus pathloss is the candidate to be reassigned. When the escape procedure is triggered by a too high Node B transmitted carrier power, the CCTrCH that has the code with the highest Node B transmitted code power is the candidate to be reassigned. The UL ISCP and the Node B transmitted carrier power are both measured by the Node B, and in both of these cases, the escape procedure is triggered by the Node B measurement signal.

[0078] If no candidate CCTrCH is found (step 512), then a status flag is set to indicate a failure condition (step 514) and the procedure terminates (step 516). If a candidate CCTrCH is found (step 512), then the WTRU capability information is retrieved from the RRM WTRU database (step 518). The pathloss of the WTRU is calculated (step 520) and a candidate code set to be reassigned is determined (step 522). The candidate code set is determined based on if the updated ISCP of the given timeslot is less than the ISCP threshold, or if the updated timeslot transmitted power is less than the transmitted power threshold after this set of codes is removed from the timeslot which has a link problem. In this determination, both the ISCP threshold and the transmitted power threshold are design parameters. If there is no code set to be reassigned (step 524), then the status flag is set to indicate a failure condition (step 514) and the procedure terminates (step 516).

[0079] If there is a code set to be reassigned (step 524), then the available timeslots for the codes to be reassigned are retrieved from the centralized database (step 526). If there are no timeslots available (step 528), then the
status flag is set to indicate a failure condition (step 514) and the procedure terminates (step 516). If there are timeslots available (step 528), then the physical channels (timeslots and codes) are allocated for the CCTrCH (step 530).

[0080] If the physical channel allocation is not successful (step 532), then the status flag is set to indicate a failure condition (step 514) and the procedure terminates (step 516). If the resource allocation is successful (step 532), then the new physical channel information is recorded in the RRM WTRU database (step 534). The resource allocation (step 532) is considered to be successful only if the optimal solution is found. The physical channel information includes a list of dedicated physical channel timeslot information, a repetition period value, and a repetition length value. The dedicated physical channel timeslot information includes the timeslot number, the midamble shift and burst type, the TFCI presence, and a list of code information. The code information includes the channelized code, the code usage status, the DPCH identification, and the code SIR target.

[0081] The physical channel information is also placed into a physical channel reconfiguration request message (step 536), the status flag is set to indicate a successful allocation (step 538), and the procedure terminates (step 516). The physical channel reconfiguration request message includes the following information: the WTRU identification, the C-RNC identification, the radio link identification, the radio resource control transaction identification, UL CCTrCH information, and DL CCTrCH information.

[0082] The step 530 relates to calling the core function of the F-DCA escape procedure to allocate the physical channels. This core function 600 is signal-independent and is described in connection with Figures 6 and 3b. The function 600 begins by receiving the code sets, the available timeslots, and an F-DCA type indicator as inputs (step 602). The first code set is selected (step 604) and a determination is made whether the code set is available in the cell (steps 606 and 608). If the selected code set is not available in the cell (step 608), then a determination is made whether there are more code sets to be examined (step 610). If there are more code sets, then the next code set is
selected (step 612) and the function continues with step 606. If there are no more code sets (step 610), this indicates a failure condition, and a status flag is set to indicate that no solution is available (step 314; Figure 3b) and the function terminates (step 316; Figure 3b).

[0083] If the selected code set is available in the cell (step 608), then the F-DCA type is checked (step 618). The F-DCA type is set based on different RRM functions such as radio bearer setup ("RBSETUP"), escape mechanism, or background interference reduction. In the escape procedure, the F-DCA type is set to "ESCAPE," and can be set at any step before step 530 above. If the F-DCA type is "ESCAPE," then the transmission power of the candidate timeslot is checked to determine if it is larger than the minimum required transmission power (step 620). If the candidate timeslot transmission power is less than the minimum value (step 622), then the status flag is set to indicate that no solution is available (step 314) and the function terminates (step 316; Figure 3b).

[0084] If the candidate timeslot transmission power is greater than the minimum value (step 622), then a check is made to determine if there are any timeslots that have a lower ISCP than the timeslot that reports the link problem (step 624). If there is no other timeslot with a lower ISCP (step 626), then the status flag is set to indicate that no solution is available (step 314; Figure 3b) and the function terminates (step 316; Figure 3b).

[0085] If there is another timeslot with a lower ISCP (step 626) or if the F-DCA type is "RBSETUP" (step 618), then the required resource units for the code set in the CCTrCH are calculated (step 640). The timeslot sequences are generated for the available timeslots (step 642) and the first timeslot sequence is selected (step 644). The method then continues with step 350, as described above in connection with Figure 3b. The steps performed if the F-DCA type is "background" (step 618) are discussed below.

[0086] Background Interference Reduction

[0087] An overview 700 of the F-DCA background interference reduction procedure 702 is shown in Figure 7. The main function of the F-DCA
background interference reduction procedure 702 consists of three parts: the pre-code allocation process 704, the code allocation process 706, and the post-code allocation process 708. The pre-code allocation process 704 is started upon receipt of a background timer trigger signal 710. The pre-code allocation process 704 gets the entry identification of a RRM cell database 716, gets Node B measurements from a RRC shared cell database 712, determines the candidate timeslots to be reassigned (one UL timeslot and one DL timeslot), retrieves a list of the available timeslots to be used for reassignment from the RRM cell database 716, determines the candidate code sets to be reassigned in the candidate timeslot in both directions, obtains WTRU capability information from a RRM WTRU database 718, and calculates the WTRU pathloss.

[0088] The code allocation process 706 checks the code availability in the cell, checks the transmission (Tx) power of the candidate timeslot, finds the assignment solution for the code set for a timeslot sequence (by assigning the candidate code set to the available timeslots), and selects the solution that has the lowest weighted ISCP as the optimal solution. The post-code allocation process 708 is responsible for recording the reallocated physical channels in the RRM WTRU database 718 and filling the physical channel information into a physical channel reconfiguration request message 720.

[0089] In addition to the data exchanges between the processes and the databases, there are data exchanges occurring directly between the processes. The WTRU measurements, the Node B measurements, a list of available timeslots in the cell, a candidate code set, and WTRU capability information are passed from the pre-code allocation process 704 to the code allocation process 706. The physical channel information (a list of timeslots and channelized codes in each timeslot) are passed from the code allocation process 706 to the post-code allocation process 708.

[0090] In the present invention, the functions of the F-DCA background interference reduction procedure 702 are modularized into two groups of functions: signal-dependent functions whose inputs are parts of signal messages and signal-independent functions whose inputs are independent of
signal messages. The purpose of separating the signal-dependent functions and the signal-independent functions is to increase the reusability of the signal-independent functions. The functions of both the pre-code allocation process 704 and the post-code allocation process 708 are signal-dependent functions. In contrast, the functions of the code allocation process 706 are signal-independent functions. Therefore, the reusability of signal-independent functions is higher than that of the signal-dependent functions. Certain functions which are inherently signal-dependent are converted in the preferred embodiment of the present invention from being signal-dependent to signal-independent, thereby increasing the reusability of the converted functions.

[0091] The flowcharts for functions of the F-DCA background interference reduction procedure are shown in Figures 8a, 8b, 6, and 3b. Figures 8a and 8b show a flowchart of the main background interference reduction procedure 800, which begins (step 802) by retrieving the entry identification of the RRM cell database (step 804). The WTRU measurements and the Node B measurements are retrieved from the shared cell database (step 806). The candidate timeslots for reassignment are determined, one UL timeslot and one DL timeslot, based upon a figure of merit of the timeslots (step 808). The timeslot with the lowest figure of merit is selected as the candidate for reassignment. If there are no timeslots to be reassigned (step 810), a status flag is set to indicate a failure condition (step 812), and the procedure terminates (step 814). If there are timeslots to be reassigned (step 810), then the link direction is set to the downlink (step 816). It is noted that the order of evaluation of link direction is arbitrary, and either the UL or the DL can be evaluated first.

[0092] The available timeslots in the cell for the selected link direction are retrieved (step 818). If there are no timeslots available (step 820), then the status flag is set to indicate a failure condition (step 812), and the procedure terminates (step 814). If there are available timeslots (step 820), then the list of available timeslots is updated to exclude the candidate timeslot (step 822). The candidate code sets to be reassigned are determined in the candidate
timeslots based on a figure of merit of the codes (step 824). The code with the lowest figure of merit is selected as the candidate for reassignment. If there are no code sets to be reassigned (step 826), then the status flag is set to indicate a failure condition (step 812), and the procedure terminates (step 814). If there are code sets to be reassigned (step 826), then the WTRU capability information is retrieved from the WTRU database (step 828).

[0093] The pathloss of the WTRU is calculated (step 830), and the physical channels for the current CCTrCH are reallocated (step 832). If the channel reallocation is not successful (step 834), then status flag is set to indicate a failure condition (step 812), and the procedure terminates (step 814). If the channel reallocation is successful (step 834), then a determination is made whether the link direction is currently UL (step 836). If the link direction is currently DL, then the link direction is set to UL (step 838) and the method continues with step 818.

[0094] If the current link direction is UL (step 836), then a determination is made whether the UL CCTrCH and the DL CCTrCH to be reassigned belong to the same WTRU (step 840). If the CCTrCHs to be reassigned belong to different WTRUs, then a flag is set to indicate that two different WTRUs are to be reassigned (step 842). If the CCTrCHs belong to the same WTRU (step 840) or if the flag has been set (step 842), then the physical channel allocation information is recorded in the RRM WTRU database (step 844). The physical channel information includes a list of dedicated physical channel timeslot information, a repetition period value, and a repetition length value. The dedicated physical channel timeslot information includes the timeslot number, the midamble shift and burst type, the TFCI presence, and a list of code information. The code information includes the channelized code, the code usage status, the DPCH identification, and the code SIR target.

[0095] The physical channel allocation information is also recorded into a physical channel reconfiguration request message (step 846), the status flag is set to indicate “success” (step 848), and the procedure terminates (step 814). If the flag indicates that two WTRUs have CCTrCHs being reassigned (step 842), the corresponding physical channel information for two WTRUs is
recorded (step 844) and two physical channel reconfiguration request messages are sent (step 846). The physical channel reconfiguration request message includes the following information: the WTRU identification, the C-RNC identification, the radio link identification, the radio resource control transaction identification, UL CCTrCH information, and DL CCTrCH information.

[0096] Step 832 relates to calling the core function of the F-DCA background interference reduction procedure to reallocate the physical channels. This core function is signal-independent and is described in connection with Figures 6 and 3b. The function 600 operates in the same manner as described above, with the following additional steps being performed in connection with the background interference reduction procedure. In the background interference reduction procedure, the F-DCA type is set to “BACKGROUND,” and it can be set at any step before step 832 above. If the F-DCA type is “BACKGROUND” (step 618), then the transmission power of the candidate timeslot is checked to determine if it is larger than the minimum required transmission power (step 630). If the candidate timeslot transmission power is less than the minimum value (step 632), then the status flag is set to indicate that no solution is available (step 314; Figure 3b) and the function terminates (step 316; Figure 3b). If the transmission power of the candidate timeslot is greater than the minimum transmission power (step 632), then the procedure continues with step 640 as described above.

[0097] Call Admission Control for Radio Link Addition

[0098] An overview 900 of a F-DCA CAC procedure for radio link addition 902 is shown in Figure 9. The main function of the F-DCA CAC procedure 902 consists of three parts: a pre-code allocation process 904, a code allocation process 906, and a post-code allocation process 908. The pre-code allocation process 904 reads WTRU measurements from a radio link addition request message 910 (hereinafter “request message”), reads Node B measurements from a RRC shared cell database 912, and retrieves CCTrCH information, DCH information, and WTRU capability information from a RRM WTRU
database 918. The pre-code allocation process 904 also retrieves a list of the available timeslots in the new cell from a RRM cell database 916, gets the data rate for the CCTrCH from a RRM WTRU database 918, and gets the code sets from an OAM RRM table database 914.

[0099] The code allocation process 906 checks the code availability in the new cell, generates timeslot sequences for the available timeslots, finds the optimal solution for the code set (assigns the codes in the code sets to the available timeslots), and allocates the channelized codes from the code vectors in the RRM cell database 916. The post-code allocation process 908 is responsible for updating code vector information in the RRM cell database 916, recording the new radio link information and physical channel information in the RRM WTRU database 918, and recording CCTrCHs information, DCHs information, DPCHs information, UL ISCP information, and power control information in a radio link addition response message 920.

[0100] In addition to the data exchanges between the processes and the databases, there are data exchanges occurring directly between the processes. The WTRU measurements, the Node B measurements, a list of the available timeslots in the cell, a list of code sets for the specific data rate, and WTRU capability information are passed from the pre-code allocation process 904 to the code allocation process 906. The physical channel information (a list of timeslots and channelized codes in each timeslot) are passed from the code allocation process 906 to the post-code allocation process 908.

[0101] In the present invention, the functions of the F-DCA CAC procedure for radio link addition 902 are modularized into two groups of functions: signal-dependent functions whose inputs are parts of signal messages and signal-independent functions whose inputs are independent of signal messages. The purpose of separating the signal-dependent functions and the signal-independent functions is to increase reusability of the signal-independent functions. The functions of both the pre-code allocation process 904 and the post-code allocation process 908 are signal-dependent functions. In contrast, the functions of the code allocation process 906 are signal-independent functions. Therefore, the reusability of signal-independent
functions is higher than that of the signal-dependent functions. Certain functions which are inherently signal-dependent are converted in the preferred embodiment of the present invention from being signal-dependent to signal-independent, thereby increasing the reusability of the converted functions.

[0102] The flowcharts for functions of the F-DCA CAC procedure for radio link addition are shown in Figures 10a-10c, which show the main interface function 1000 for the F-DCA CAC for RL addition procedure. The function 1000 begins by obtaining the RL addition request message (step 1002) and extracting the WTRU identification, the new radio link identification, and the new cell identification from the request message (step 1004). The request message also contains new RL information with or without WTRU measurements.

[0103] The entry identification of a new cell in the RRM cell database is obtained (step 1006). The Node B measurements for the new cell are obtained from the RRC shared cell database and are stored locally in a measurement data structure (step 1008). The measurement data structure is stored in the F-DCA CAC function dynamically. It is created after the F-DCA CAC function is called and deleted when the F-DCA CAC function is exited. The Node B measurements include common measurements and dedicated measurements. The Node B common measurements include the UL ISCP information and the DL transmitted carrier power. The Node B dedicated measurements include the DL transmitted code power. Then, the old cell identification is retrieved based on the WTRU ID from the RRM WTRU database; CCTRCHs information and DCHs information belonging to that WTRU’s radio link in the old cell are retrieved from RRM WTRU database (step 1010).

[0104] Next, a determination is made whether the WTRU measurements, which include the DL ISCP and the downlink primary common control physical channel received signal code power (P-CCPCH RSCP), are included in the request message (step 1012). If the WTRU measurements are not included in the request message, then the service type is retrieved from the RRM
WTRU information (step 1014) and a check is made to determine whether all of the DCHs are NRT (step 1016).

[0105] If all the DCHs are not NRT, then a status flag is set to indicate a failure condition (step 1018) and the function terminates (step 1020). The failure condition here means that there is not enough information to process the function further. It is noted that all the DCHs not being NRT alone is not a failure condition; the failure condition is reached when there are no WTRU measurements and all of the DCHs are not NRT. If all of the DCHs are NRT (step 1016), then the low rate temporary DCHs are allocated for both UL and DL CCTrCHs (step 1022). After the channels are allocated, a determination is made whether the resource allocations were successful (step 1024). If the resource allocations were not successful, then the status flag is set to indicate a failure condition (step 1018) and the function terminates (step 1020). If the resource allocations were successful, then the new RL information and the physical channel information are recorded in the RRM WTRU database, and the code vector information is updated in the RRM cell database (step 1026).

[0106] The recorded information includes the new RL information and the new RRC transaction identification. The RL information includes the RL identification, the cell identification, the UL CCTrCH information, and the DL CCTrCH information. The CCTrCH information includes the CCTrCH identification, the CCTrCH status, the CCTrCH SIR target, the guaranteed data rate, the allowed data rate, and the DPCH information. The DPCH information includes a list of DPCH timeslot information, a repetition period value, and a repetition length value. The DPCH timeslot information includes the timeslot number, the midamble shift and burst type, the TFCI presence, and a list of code information. The code information includes the channelized code, the code usage status, the DPCH identification, and the code SIR target.

[0107] The updated code vector information includes both UL code vector information and DL code vector information. The UL code vector information includes a code identification, a code block indication, and a code usage status. The DL code vector information includes a code identification and a code usage status.
[0108] If the WTRU measurements are available in the request message (step 1012), then the WTRU measurements are retrieved from the request message and are stored locally (step 1032). The first DL CCTrCH is selected (step 1034) and the WTRU capability information is retrieved from the RRM WTRU database based on the WTRU identification, the link direction, and the old cell identification (step 1036). The service type for the selected CCTrCH is obtained from the RRM WTRU database (step 1038). If the service type is RT (step 1040), the available timeslots in the cell are determined (step 1042). If no timeslots are available (step 1044), the status flag is set to indicate a failure condition (step 1018) and the procedure terminates (step 1020).

[0109] If there are timeslots available in the new cell (step 1044), then the highest requested data rate for this CCTrCH in the old cell is retrieved from the RRM WTRU database (step 1046). The code sets for the requested data rate are obtained (step 1048) and the physical channels (timeslots and codes) for the present CCTrCH are allocated and the optimal solution is recorded if found (step 1050). The allocation function in step 1050 was discussed in greater detail above in connection with Figures 3a and 3b. If the resource allocation was not successful (step 1052), then the status flag is set to indicate a failure condition (step 1018) and the procedure terminates (step 1020).

[0110] If the resource allocation was successful (step 1052), then a determination is made whether there are additional CCTrCHs in the current direction (i.e., downlink or uplink) to be examined (step 1054). If there are additional CCTrCHs to be examined, then the next CCTrCH is selected (step 1056) and the procedure continues at step 1038. If there are no additional CCTrCHs to be examined (step 1054), then a determination is made whether the UL CCTrCHs have been examined (step 1058). If the UL CCTrCHs have not been examined, then the first UL CCTrCH is selected (step 1060) and the procedure continues at step 1036. If all of the UL CCTrCHs have been considered (step 1058), then the procedure continues at step 1026 as described above.

[0111] Next, CCTrCHs information with newly allocated physical channel information, DCHs information, UL timeslot ISCP information, and power
control information are placed into a RL addition response message (step 1028), the status flag is set to indicate a success condition (step 1030), and the procedure terminates (step 1020). The CCTrCH information includes the CCTrCH identification and the DPCH information. The DPCH information includes a list of timeslot information, a repetition period and a repetition length. The DPCH timeslot information includes the timeslot number, the midamble shift and burst type, the TFCI presence, and a list of code information. The code information includes the channelized code, and the DPCH identification. The DCHs information includes diversity indication and choice diversity indication. The power control information includes the UL target SIR, the maximum UL SIR, the minimum UL SIR, the initial DL transmission power, the maximum DL transmission power, and the minimum DL transmission power.

[0112] If the service type is NRT (step 1040), the available timeslots in the new cell are determined (step 1062). If no timeslots are available in the new cell (step 1064), then the status flag is set to indicate a failure condition (step 1018) and the procedure terminates (step 1020).

[0113] If there are timeslots available in the new cell (step 1064), then all data rates suitable for the NRT service of the CCTrCH are retrieved from the RRM WTRU database (step 1066) and the highest data rate is selected (step 1068). The code sets for the selected data rate are obtained (step 1070) and the normal temporary DCHs for the present CCTrCH are allocated and the optimal solution is recorded if found (step 1072). It is noted that steps 1050 and 1072 are essentially the same; in NRT service, the DCHs are temporary. If the resource allocation was not successful (step 1074), then a determination is made whether there are additional data rates to be examined (step 1076). If there are no other data rates to be examined, then the status flag is set to indicate a failure condition (step 1018) and the procedure terminates (step 1020). If there are other data rates to be examined (step 1076), then the next highest data rate is selected (step 1078) and the procedure continues at step 1070. If the resource allocation was successful (step 1074), then the procedure continues at step 1054 as described above.
[0114] It is noted that in connection with steps 1034, 1058, and 1060 that either direction (DL or UL) can be performed first. As described above, the DL direction is examined prior to the UL direction. The function 1000 will operate in the same manner if instead the UL was examined prior to the DL.

[0115] The steps 1050 and 1072 relate to calling the channel allocation function of the F-DCA algorithms; this core function 300 is signal-independent and operates in the same manner as described above in connection with Figures 3a and 3b.

[0116] **Call Admission Control for Radio Link Reconfiguration**

[0117] An overview 1100 of the F-DCA CAC procedure for radio link reconfiguration 1102 is shown in Figure 11. The F-DCA CAC procedure 1102 consists of three parts: a pre-code allocation process 1104, a code allocation process 1106, and a post-code allocation process 1108. The pre-code allocation process 1104 retrieves WTRU information from a radio link reconfiguration prepare message 1110 and retrieves WTRU capability information from a RRM WTRU database 1118. WTRU and Node B measurements are retrieved from a RRC shared cell database 1112. A list of the available timeslots is obtained from a RRM cell database 1116 and code sets are retrieved from an OAM RRM table database 1114.

[0118] The code allocation process 1106 checks the code availability in the cell, generates timeslot sequences, finds the optimal solution for the code set (assigns the codes in the code sets to the available timeslots and allocates the channelized codes from the code vectors in the RRM cell database 1116). The post-code allocation process 1108 updates code vector information in the RRM cell database 1116, records the allocated physical channels in the RRM WTRU database 1118, and records the physical channel parameters and power control information in a radio link reconfiguration ready message 1120.

[0119] In addition to the data exchanges between the processes and the database, there are data exchanges occurring directly between the processes. The WTRU measurements, the Node B measurements, a list of available timeslots in the cell, a list of code sets for the specific data rate, and WTRU
capability information are passed from the pre-code allocation process 1104 to the code allocation process 106. The physical channel information (a list of timeslots and channelized codes in each timeslot) is passed from the code allocation process 1106 to the post-code allocation process 1108.

[0120] In the present invention, the functions of the F-DCA CAC procedure for radio link reconfiguration 1102 are modularized into two groups of functions: signal-dependent functions whose inputs are parts of signal messages and signal-independent functions whose inputs are independent of signal messages. The purpose of separating the signal-dependent functions and the signal-independent functions is to increase the reusability of the signal-independent functions. The functions of both the pre-code allocation process 1104 and the post-code allocation process 1108 are signal-dependent functions. In contrast, the functions of the code allocation process 1106 are signal-independent functions. It is to be noted that the functions of the code allocation process 1106 can be reused by other procedures in other RRM function implementations.

[0121] The flowcharts for functions of the F-DCA CAC procedure for radio link reconfiguration are shown in Figures 12 and 13a-13c. Figure 12 shows a flowchart of the main interface procedure 1200 of the F-DCA CAC for radio link reconfiguration procedure. The procedure 1200 begins by obtaining the RL reconfiguration prepare message (referred to hereinafter as “prepare message”; step 1202). The prepare message contains CCTrCH information (about a CCTrCH to be added or modified), DCH information (about a DCH to be added or modified), and RL information with or without WTRU measurements. The WTRU measurements include the DL ISCP and the DL P-CCPCH RSCP. The WTRU identification and the RL identification are extracted from the prepare message and the cell identification is retrieved from the WTRU database (step 1204). The entry identification of the RRM cell database is then obtained (step 1206).

[0122] A data structure is created to store measurements locally (step 1208). This measurement data structure is stored in the F-DCA CAC function dynamically. It is created after the F-DCA CAC function is called and is
deleted when the F-DCA CAC function is exited. The Node B measurements are then retrieved from the RRC shared cell database and are stored locally (step 1210). The Node B measurements include common measurements and dedicated measurements. The Node B common measurements include the UL ISCP and the DL transmitted carrier power. The Node B dedicated measurements include the DL transmitted code power.

[0123] The measurement data structure includes a list of cell measurement records. A cell measurement record includes the cell identification and a list of timeslot measurement records. A timeslot measurement record contains the timeslot number, the timeslot ISCP, the timeslot carrier power, and a list of code measurement records. A code measurement record consists of the WTRU identification, the radio link identification, the DPCH identification, and the code transmitted power.

[0124] If the WTRU measurements are included in the prepare message (step 1212), then the WTRU measurements are extracted from the prepare message and are stored locally in the measurement data structure (step 1214). The physical channels are then allocated for the CCTrCHs to be added or modified (step 1216). It is noted that the code allocation procedure (step 1216) is the same, whether CCTrCHs are to be added or modified. The channel allocation procedure will be discussed in greater detail in connection with Figures 13a-13c, below. If the physical channel allocation is a success (step 1218), then a status flag is set to indicate the success condition (step 1220) and the procedure terminates (step 1222). If the channel allocation is not successful (step 1218), then the status flag is set to indicate a failure condition (step 1224) and the procedure terminates (step 1222).

[0125] If the WTRU measurements are not included in the prepare message (step 1212), then a determination is made whether all of the DCHs are NRT (step 1226). If all the DCHs are not NRT, then this indicates a failure condition, and the status flag is set to indicate the failure condition (step 1224) and the procedure terminates (step 1222). If all the DCHs are NRT (step 1228), then the RL reconfiguration type is determined (step 1230). The RL configuration type is set based upon the CCTrCH in the RL. If the CCTrCH is
to be added, then the RL configuration type is set to "ADDITION." If the CCTrCH is to be modified, then the RL configuration type is set to "MODIFY."

[0126] If the RL reconfiguration type is "MODIFY", then this indicates a failure condition, and the status flag is set to indicate the failure condition (step 1224) and the procedure terminates (step 1222). The failure condition indicates that there is not enough information to process the request further. The failure condition is reached when the RL configuration type is "MODIFY" and the RL reconfiguration message does not include the WTRU measurements.

[0127] If the RL reconfiguration type is "ADDITION" (step 1230), then the low rate temporary DCHs are allocated for the CCTrCHs to be added (step 1232). The procedure then continues with step 1218, as described above.

[0128] Figures 13a-13c show a flowchart of a channel allocation procedure 1300, which is used by step 1216 of the F-DCA CAC RL reconfiguration procedure 1200. The procedure 1300 begins by obtaining the prepare message (step 1302) and extracting the WTRU identification and the RL identification from the prepare message (step 1304).

[0129] The first DL CCTrCH is selected (step 1306) and the WTRU capabilities are retrieved from the WTRU database (step 1308). The service type for the selected CCTrCH is obtained (step 1310), and if the service type is RT (step 1312), then the available timeslots for the RT in the cell are determined (step 1314). If no timeslots are available (step 1316), this indicates a failure condition, and a status flag is set to indicate the failure condition (step 1318) and the procedure terminates (step 1320).

[0130] If there are timeslots available (step 1316), then the block error rate (BLER) for the selected CCTrCH is determined (step 1322) and the requested data rate is calculated (step 1324). The code sets for the calculated data rate are obtained (step 1326) and the physical channels (timeslots and codes) for the selected CCTrCH are allocated and the optimal solution is recorded if found (step 1328). The allocation function in step 1328 is discussed in greater detail above in connection with Figures 3a and 3b. If the resource allocation
was not successful (step 1330), then the status flag is set to indicate a failure condition (step 1318) and the function terminates (step 1320).

[0131] If the resource allocation was successful (step 1330), then a determination is made whether there are additional CCTrCHs in the current direction (i.e., DL or UL) to be examined (step 1332). If there are additional CCTrCHs to be examined, then the next CCTrCH in the current direction is selected (step 1334) and the procedure continues at step 1310. If there are no additional CCTrCHs to be examined (step 1332), then a determination is made whether the UL CCTrCHs have been examined (step 1336). If the UL CCTrCHs have not been examined, then the first UL CCTrCH is selected (step 1338) and the procedure continues at step 1308. If all of the UL CCTrCHs have been considered (step 1336), then the WTRU information and the physical channel information are updated in the RRM WTRU database, and the code vector information is updated in the RRM cell database (step 1340).

[0132] The updated WTRU information includes both the UL CCTrCH information (for a CCTrCH to be added or modified) and the DL CCTrCH information (for a CCTrCH to be added or modified) with newly allocated physical channel information. The CCTrCH information includes the CCTrCH identification, the CCTrCH status, the CCTrCH SIR target, the guaranteed data rate, the allowed data rate, and the DPCH information. The DPCH information includes a list of DPCH timeslot information, a repetition period, and a repetition length. The DPCH timeslot information includes the timeslot number, the midamble shift and burst type, the TFCI presence, and a list of code information. The code information includes the channelized code, the code usage status, the DPCH identification, and the code SIR target. The code vector information includes the UL code vector information and the DL code vector information. The UL code vector information includes a code identification, a code block indication, and a code usage status. The DL code vector information includes a code identification and a code usage status.

[0133] The physical channel information and the power control information are then put into a RL reconfiguration ready message (step 1342), the status flag is set to indicate a successful resource allocation (step 1344), and the
procedure terminates (step 1320). The physical channel information includes a list of timeslot information, a repetition period and a repetition length. The timeslot information includes the timeslot number, the midamble shift and burst type, the TFCl presence, and a list of code information. The code information includes the channelized code and the DPCH identification. The power control information includes the initial DL transmission power, the maximum DL transmission power, the minimum DL transmission power, the maximum UL SIR and the minimum UL SIR. In one implementation of the present invention, a single data structure is used for both the request message and the response message since these two messages include a lot of common information.

[0134] If the service type for the selected CCTrCH is NRT (step 1312), then the available timeslots for the NRT in the cell are determined (step 1346). If no timeslots are available (step 1348), the status flag is set to indicate a failure condition (step 1318) and the procedure terminates (step 1320). If there are timeslots available (step 1348), then the BLER for the selected CCTrCH is determined (step 1350). All data rates suitable for the NRT service are determined (step 1352) and the highest data rate is selected (step 1354). The code sets for the selected data rate are obtained (step 1356) and the normal temporary DCHs for the selected CCTrCH are allocated and the optimal solution is recorded if found (step 1358). It is noted that steps 1328 and 1358 are essentially the same; in NRT service, the DCHs are temporary.

[0135] If the resource allocation was not successful (step 1360), then a determination is made whether there are additional data rates to be examined (step 1362). If there are no other data rates to be examined, then the status flag is set to indicate a failure condition (step 1318) and the procedure terminates (step 1320). If there are other data rates to be examined (step 1362), then the next highest data rate is selected (step 1364) and the procedure continues at step 1356. If the resource allocation was successful (step 1360), then the procedure continues at step 1332 as described above.

[0136] It is noted that in connection with steps 1306, 1336, and 1338 that either direction (DL or UL) can be performed first. As described above, the DL
direction is examined prior to the UL direction. The procedure 1300 will operate in the same manner if instead the UL was examined prior to the DL.

[0137] The steps 1328 and 1358 relate to calling the channel allocation function of the F-DCA algorithms; this core function is signal-independent and is described above in connection with Figures 3a and 3b.

[0138] Although the preferred embodiments are described in conjunction with a third generation partnership program (3GPP) wideband code division multiple access (W-CDMA) system utilizing the time division duplex (TDD) mode, the embodiments are applicable to any hybrid code division multiple access (CDMA)/time division multiple access (TDMA) communication system. Additionally, some embodiments are applicable to CDMA systems, in general, using beamforming, such as the proposed frequency division duplex (FDD) mode of 3GPP W-CDMA. While specific embodiments of the present invention have been shown and described, many modifications and variations could be made by one skilled in the art without departing from the scope of the invention. The above description serves to illustrate and not limit the particular invention in any way.

*        *        *
CLAIMS

What is claimed is:

1. A method for fast dynamic channel allocation call admission control in a wireless communication system, comprising:
   a pre-code allocation process;
   a signal-independent code allocation process, including:
      checking the availability of a code set in the cell;
      generating timeslot sequences for the available timeslots;
      assigning a code set to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution;
      calculating the interference signal code power (ISCP) for each solution; and
      selecting the solution having the lowest weighted ISCP as an optimal solution; and
   a post-code allocation process.

2. The method according to claim 1, wherein the call admission control is for radio link setup and the pre-code allocation process includes:
   receiving a request message;
   processing the request message;
   obtaining Node B measurements from a centralized database; and
   obtaining available timeslots from the centralized database.

3. The method according to claim 2, wherein the processing step includes:
   reading wireless transmit/receive unit (WTRU) measurements from the request message;
   reading WTRU coded composite transport channel information and dedicated channel information from the request message;
   reading WTRU capability information from the request message; and
   obtaining code sets from the centralized database, based upon a requested data rate contained in the request message.
4. The method according to claim 1, wherein the post-code allocation process includes:

storing allocation information in a centralized database; and
creating a response message.

5. The method according to claim 4, wherein the call admission control is for radio link setup and the storing step includes:

creating a wireless transmit/receive unit (WTRU) entity in the database;
recording WTRU information from the request message in the database; and
recording physical channel information in the database.

6. The method according to claim 4, wherein the call admission control is for radio link setup and the creating step includes:

adding power control information to the response message; and
adding physical channel information to the response message.

7. The method according to claim 4, wherein the call admission control is for radio link addition and the storing step includes:

recording new radio link information from the request message in the database; and
recording physical channel information in the database.

8. The method according to claim 4, wherein the call admission control is for radio link addition and the creating step includes:

adding coded composite transport channel information to the response message;
adding physical channel information to the response message;
adding dedicated channel information to the response message;
adding uplink timeslot ISCP information to the response message; and
adding power control information to the response message.

9. The method according to claim 1, wherein the pre-code allocation process includes:
   receiving a request message;
   processing the request message; and
   retrieving system information from a centralized database.

10. The method according to claim 9, wherein the call admission control is for radio link addition and the processing step includes:
    reading wireless transmit/receive unit (WTRU) measurements from the request message; and
    retrieving the WTRU identification, the new radio link identification, and the new cell identification from the request message.

11. The method according to claim 9, wherein the call admission control is for radio link addition and the retrieving step includes:
    retrieving Node B measurements for the new cell;
    obtaining the old cell identification;
    reading wireless transmit/receive unit (WTRU) coded composite transport channel (CCTrCH) information and dedicated channel information;
    retrieving WTRU capability information;
    retrieving a list of available timeslots in the new cell;
    retrieving data rates for CCTrCHs; and
    retrieving a list of code sets for the requested data rate.

12. The method according to claim 9, wherein the call admission control is for radio link reconfiguration and the processing step includes:
    reading wireless transmit/receive unit (WTRU) measurements from the request message; and
    reading WTRU coded composite transport channel information and dedicated channel information from the request message.
13. The method according to claim 9, wherein the call admission control is for radio link reconfiguration and the retrieving step includes:
   retrieving wireless transmit/receive unit (WTRU) capability information;
   retrieving Node B measurements from the centralized database;
   retrieving a list of available timeslots from the centralized database; and
   retrieving a list of code sets from the centralized database.

14. The method according to claim 1, wherein the call admission control is for radio link reconfiguration and the post-code allocation process includes:
   updating wireless transmit/receive unit (WTRU) information in a centralized database; and
   creating a response message.

15. The method according to claim 14, wherein the updating step includes recording new coded composite transport channel (CCTrCH) information and associated physical channel allocation information in the centralized database.

16. The method according to claim 14, wherein the creating step includes
   adding power control information to the response message; and
   adding physical channel allocation information to the response message.

17. A method for a fast dynamic channel allocation call admission control (CAC) in a wireless communication system, comprising the steps of:
   receiving a request message to initiate the CAC function;
   processing the request message;
obtaining Node B measurements from a centralized database;
retrieving a list of available timeslots and a list of code sets from the centralized database;
allocating a code set to the available timeslots in a timeslot sequence;
storing the allocation information in the centralized database; and
sending a response message with the results of the code allocation process.

18. The method according to claim 17, wherein the processing step includes reading wireless transmit/receive unit (WTRU) measurements, WTRU coded composite transport channel information, and dedicated channel information from the request message.

19. The method according to claim 18, wherein the WTRU measurements include downlink interference signal code power.

20. The method according to claim 17, wherein the retrieving step further includes reading Node B measurements from the centralized database.

21. The method according to claim 20, wherein the Node B measurements include:
common measurements, including uplink interference signal code power and downlink transmitted carrier power; and
dedicated measurements, including downlink transmitted code power.

22. The method according to claim 17, wherein the allocating step includes the steps of:
checking the availability of a code set in the cell;
generating timeslot sequences from the list of available timeslots; and
assigning a code set to the available timeslots in a timeslot sequence to find a solution, wherein a successful assignment is a solution.
23. The method according to claim 22, wherein the allocating step further includes the steps of:
   calculating an interference signal code power (ISCP) value for the solution; and
   selecting the solution having the lowest weighted ISCP value as an optimal solution.

24. The method according to claim 17, wherein the storing step includes:
   creating a wireless transmit/receive unit (WTRU) entity in the centralized database;
   recording WTRU information from the request message in the centralized database; and
   recording physical channel information in the centralized database.

25. The method according to claim 24, wherein the WTRU information recorded in the centralized database includes:
   the WTRU identification;
   a transaction identification;
   uplink WTRU capability information, including:
       the maximum number of timeslots per frame; and
       the maximum number of uplink physical channels per timeslot;
   downlink WTRU capability information, including:
       the maximum number of timeslots per frame; and
       the maximum number of downlink physical channels per timeslot; and
   radio link information.

26. The method according to claim 25, wherein the radio link information includes:
   the radio link identification;
   a cell identification;
uplink code composite transport channel (CCTrCH) information; and
downlink CCTrCH information.

27. The method according to claim 26, wherein the CCTrCH information includes:
   a CCTrCH identification;
   a CCTrCH status;
   a CCTrCH signal to interference ratio target;
   a guaranteed data rate;
   an allowed data rate; and
   dedicated physical channel information.

28. The method according to claim 27, wherein the dedicated physical channel information includes:
   dedicated physical channel timeslot information;
   a repetition period value; and
   a repetition length value.

29. The method according to claim 28, wherein the dedicated physical channel information includes:
   a timeslot number;
   a midamble shift and burst type;
   a transport format combination indicator presence; and
   code information.

30. The method according to claim 29, wherein the code information includes:
   a channelized code;
   a code usage status;
   a dedicated physical channel identification; and
   a code signal to interference target.
31. The method according to claim 17, wherein the sending step includes filling the response message with power control information and physical channel information.

32. The method according to claim 31, wherein the power control information includes:
   an uplink (UL) target signal to interference ratio (SIR);
   a maximum UL SIR;
   a minimum UL SIR;
   an initial downlink (DL) transmission power;
   a minimum DL transmission power; and
   a maximum allowed UL transmission power.

33. The method according to claim 31, wherein the physical channel information includes:
   a list of timeslots; and
   the channelized codes in each timeslot.

34. A method of implementing a fast dynamic channel allocation escape procedure in a wireless communication system, comprising:
   a pre-code allocation procedure;
   a signal-independent code allocation procedure, including:
      checking the availability of a code set in the cell;
      checking the transmission power of a candidate timeslot;
      checking if the interference signal code power (ISCP) for other timeslots is lower than the ISCP of the candidate timeslot;
   generating timeslot sequences for the available timeslots;
   assigning a code set to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution;
   calculating the ISCP for each solution; and
   selecting the solution having the lowest weighted ISCP as an optimal solution; and
a post-code allocation procedure.

35. The method according to claim 34, wherein the pre-code allocation procedure includes:
   receiving a trigger signal;
   obtaining wireless transmit/receive unit (WTRU) measurements and Node B measurements;
   retrieving cell configuration information and WTRU information from a centralized database;
   determining a candidate coded composite transport channel to be reassigned;
   determining a candidate code set to be reassigned; and
   obtaining a list of the available timeslots from the centralized database.

36. The method according to claim 34, wherein the post-code allocation procedure includes:
   storing new allocation information in a centralized database; and
   creating a physical channel reconfiguration request message.

37. A method of implementing a fast dynamic channel allocation escape procedure in a wireless communication system, comprising the steps of:
   receiving a trigger signal to initiate the escape procedure;
   processing the trigger signal;
   retrieving wireless transmit/receive unit (WTRU) measurements from a centralized database;
   retrieving Node B measurements from the centralized database;
   determining physical resources to be reassigned;
   retrieving a list of available timeslots from the centralized database;
   retrieving WTRU capability information from the centralized database;
   allocating a code set to the available timeslots in a timeslot sequence;
   storing the allocation information in the centralized database; and
sending a physical channel reconfiguration request message containing the allocation information.

38. The method according to claim 37, wherein the WTRU measurements include downlink interference signal code power.

39. The method according to claim 37, wherein the Node B measurements include:
   common measurements, including uplink interference signal code power and downlink transmitted carrier power; and
   dedicated measurements, including downlink transmitted code power.

40. The method according to claim 37, wherein the determining step includes:
   determining a candidate coded composite transport channel (CCTrCH) to be reassigned;
   determining a candidate code set to be reassigned; and
   retrieving a list of available timeslots to be reassigned.

41. The method according to claim 40, wherein the candidate CCTrCH to be reassigned is determined by how the escape procedure is triggered.

42. The method according to claim 41, wherein
   the escape procedure is triggered by a too high downlink (DL) interference signal code power (ISCP) of a WTRU in a timeslot, the DL ISCP being contained in the WTRU measurements; and
   the candidate CCTrCH is the CCTrCH of the WTRU in the timeslot.

43. The method according to claim 41, wherein
the escape procedure is triggered by a too high uplink (UL) interference signal code power (ISCP) in a timeslot, the UL ISCP being contained in the Node B measurements; and

the candidate CCTrCH is the CCTrCH having the code with the highest value of signal to interference ratio target plus pathloss.

44. The method according to claim 41, wherein

the escape procedure is triggered by a too high Node B transmitted carrier power in a timeslot, contained in the Node B measurements; and

the candidate CCTrCH is the CCTrCH having the code with the highest Node B transmitted code power.

45. The method according to claim 40, wherein the candidate code set is determined based on if the updated ISCP of the given timeslot is less than the ISCP threshold, or if the updated timeslot transmitted power is less than the transmitted power threshold after this set of codes is removed from the timeslot which has a link problem.

46. The method according to claim 37, wherein the WTRU capability information includes:

the uplink WTRU capability information; and

the downlink WTRU capability information.

47. The method according to claim 46, wherein the uplink WTRU capability information includes:

the maximum number of uplink timeslots per frame; and

the maximum number of uplink physical channels per timeslot.

48. The method according to claim 46, wherein the downlink WTRU capability information includes:

the maximum number of downlink timeslots per frame; and

the maximum number of downlink physical channels per frame.
49. The method according to claim 37, wherein the allocating step includes:
   checking the availability of a code set in the cell;
   checking the transmission power of a candidate timeslot;
   checking if the interference signal code power (ISCP) for other timeslots
   is lower than that of the candidate timeslot;
   generating timeslot sequences from the list of available timeslots; and
   assigning a code set to the available timeslots in a timeslot sequence to
   find a solution, wherein a successful assignment is a solution.

50. The method according to claim 49, wherein the allocating step
    further includes:
    calculating an ISCP value for each solution; and
    selecting the solution having the lowest weighted ISCP value as an
    optimal solution.

51. The method according to claim 37, wherein the storing step
    includes recording physical channel information in the centralized database.

52. The method according to claim 51, wherein the physical channel
    information includes:
    dedicated physical channel timeslot information;
    a repetition period value; and
    a repetition length value.

53. The method according to claim 52, wherein the dedicated
    physical channel timeslot information includes:
    the timeslot number;
    a midamble shift and burst type;
    a transport format combination indicator presence; and
    code information.
54. The method according to claim 53, wherein the code information includes:
   a channelized code;
   a code usage status;
   a dedicated physical channel identification; and
   a code signal to interference target.

55. The method according to claim 37, wherein the sending step includes filling the physical channel reconfiguration request message.

56. The method according to claim 55, wherein physical channel reconfiguration request message includes:
   the WTRU identification;
   a controlling radio network controller identification;
   a radio link identification;
   a radio resource control transaction identification;
   uplink coded composite transport channel (CCTrCH) information; and
   downlink CCTrCH information.

57. The method according to claim 56, wherein the CCTrCH information includes dedicated physical channel (DPCH) information.

58. The method according to claim 57, wherein the DPCH information includes DPCH timeslot information.

59. The method according to claim 58, wherein the DPCH timeslot information includes:
   the timeslot number;
   the midamble shift and burst type;
   the transport format combination indicator presence; and
   the code information.
60. The method according to claim 59, wherein the code information includes:

the DPCH identification; and

the channelization code.

61. A method of implementing a fast dynamic channel allocation background interference reduction procedure in a wireless communication system, comprising:

a pre-code allocation procedure;

a signal-independent code allocation procedure, including:

checking the availability of a code set in the cell;

checking the transmission power of a candidate timeslot;

generating timeslot sequences for the available timeslots;

assigning a code set to the available timeslots in a timeslot sequence, wherein a successful assignment is a solution;

calculating the interference signal code power (ISCP) for each solution; and

selecting the solution having the lowest weighted ISCP as an optimal solution; and

a post-code allocation procedure.

62. The method according to claim 61, wherein the pre-code allocation procedure includes:

receiving a trigger signal;

obtaining Node B measurements;

retrieving cell configuration information;

determining the candidate timeslots for both directions to be reassigned;

determining the candidate code sets for each direction to be reassigned;

obtaining wireless transmit/receive unit information from a centralized database; and
obtaining a list of the available timeslots from the centralized database.

63. The method according to claim 61, wherein the post-code allocation procedure includes:

storing reallocation information in a centralized database; and
creating a physical channel reconfiguration request message.

64. A method of implementing a fast dynamic channel allocation background interference reduction procedure in a wireless communication system, comprising the steps of:

receiving a trigger signal to initiate the background interference reduction procedure;

retrieving system measurements from a centralized database;
determining physical resources to be reassigned;

retrieving a list of available timeslots from the centralized database;

retrieving wireless transmit/receive unit (WTRU) capability information from the centralized database;

allocating a code set to the available timeslots in a timeslot sequence;
storing the reallocation information in the centralized database; and

sending a physical channel reconfiguration request message containing the reallocation information.

65. The method according to claim 64, wherein the retrieving step includes:

reading WTRU measurements from the centralized database; and

reading Node B measurements from the centralized database.

66. The method according to claim 65, wherein the WTRU measurements include downlink interference signal code power.

67. The method according to claim 65, wherein the Node B measurements include:
common measurements, including uplink signal interference signal code power and downlink transmitted carrier power; and
dedicated measurements, including downlink transmitted code power.

68. The method according to claim 64, wherein the determining step includes:
determining candidate timeslots to be reassigned, one timeslot on the uplink direction and one timeslot on the downlink direction; and
determining candidate code sets in the candidate timeslots to be reassigned.

69. The method according to claim 68, wherein the candidate timeslot is one that has the lowest figure of merit.

70. The method according to claim 68, wherein the candidate code sets are those that have the lowest figure of merit.

71. The method according to claim 64, wherein the WTRU capability information includes:
uplink WTRU capability information, including:
a maximum number of timeslots per frame; and
a maximum number of uplink physical channels per timeslot;
and
downlink WTRU capability information, including:
a maximum number of timeslots per frame; and
a maximum number of downlink physical channels per frame.

72. The method according to claim 64, wherein the allocating step includes:
checking the availability of a code set in the cell;
checking the transmission power of a candidate timeslot;
generating timeslot sequences from the list of available timeslots; and
assigning a code set to the available timeslots in a timeslot sequence to find a solution, wherein a successful assignment is a solution.

73. The method according to claim 72, wherein the allocating step further includes:
   calculating an interference signal code power (ISCP) value for the solution; and
   selecting the solution having the lowest weighted ISCP value as an optimal solution.

74. The method according to claim 64, wherein the storing step includes recording physical channel information in the centralized database.

75. The method according to claim 74, wherein the physical channel information includes:
   dedicated physical channel timeslot information;
   a repetition period value; and
   a repetition length value.

76. The method according to claim 75, wherein the dedicated physical channel timeslot information includes:
   the timeslot number;
   a midamble shift and burst type;
   a transport format combination indicator presence; and
   code information.

77. The method according to claim 76, wherein the code information includes:
   a channelized code;
   a code usage status;
   a dedicated physical channel identification; and
   a code signal to interference target.
78. The method according to claim 64, wherein the sending step includes filling the physical channel reconfiguration request message.

79. The method according to claim 78, wherein the physical channel reconfiguration message includes:
   a WTRU identification;
   a controlling radio network controller identification;
   a radio link identification;
   a radio resource control identification;
   uplink coded composite transport channel (CCTrCH) information; and
downlink CCTrCH information.

80. The method according to claim 79, wherein the CCTrCH information includes dedicated physical channel (DPCH) information.

81. The method according to claim 80, wherein the DPCH information includes DPCH timeslot information.

82. The method according to claim 81, wherein the DPCH timeslot information includes:
   the timeslot number;
   a midamble shift and burst type;
   a transport format combination indicator presence; and
code information.

83. The method according to claim 82, wherein the code information includes:
   the DPCH identification; and
   a channelization code.
84. A method for call admission control (CAC) for radio link addition in a fast dynamic channel allocation wireless communication system, comprising the steps of:

receiving a request message to initiate the CAC function;
processing the request message;
retrieving Node B measurements from a centralized database;
reading wireless transmit/receive unit (WTRU) coded composite transport channel (CCTrCH) information and dedicated channel information from the centralized database;
retrieving WTRU capability information from the centralized database;
retrieving a list of available timeslots in the new cell from the centralized database;
retrieving data rates for CCTrCHs from the centralized database;
retrieving a list of code sets for the requested data rate from the centralized database;
allocating the code sets to the available timeslots in the new cell;
storing the new radio link (RL) information and allocation information in the centralized database; and
creating a response message with the results of the code allocation process.

85. The method according to claim 84, wherein the processing step includes:

retrieving the WTRU identification, the new RL identification, and the new cell identification from the request message; and
reading WTRU measurements from the request message.

86. The method according to claim 85, wherein the WTRU measurements include the downlink timeslot interference signal code power and the downlink primary common control physical channel received signal code power.
87. The method according to claim 84, wherein the Node B measurements include:

common measurements, including uplink interference signal code power and downlink transmitted carrier power; and
dedicated measurements, including downlink transmitted code power.

88. The method according to claim 84, wherein the WTRU capability information includes:

uplink WTRU capability information, including:
the maximum number of timeslots per frame; and
the maximum number of uplink physical channels per timeslot;
and
downlink WTRU capability information, including:
the maximum number of timeslots per frame; and
the maximum number of downlink physical channels per frame.

89. The method according to claim 84, wherein the allocating step includes the steps of:

checking the availability of a code in the new cell;
generating timeslot sequences from the list of available timeslots; and
assigning a code set to the available timeslots in a timeslot sequence to find a solution, wherein a successful assignment is a solution.

90. The method according to claim 89, wherein the allocating step further includes the steps of:

calculating an interference signal code power (ISCP) value for the solution; and
selecting the solution having the lowest weighted ISCP value as an optimal solution.

91. The method according to claim 84, wherein the storing step includes:
recording new RL information from the request message;
recording physical channel information; and
updating code vector information.

92. The method according to claim 91, wherein the storing step further includes recording the new radio resource control transaction identification.

93. The method according to claim 91, wherein the RL information includes:
   the RL identification;
   the cell identification;
   uplink code composite transport channel (CCTrCH) information; and
downlink CCTrCH information.

94. The method according to claim 93, wherein the CCTrCH information includes:
   a CCTrCH identification;
   a CCTrCH status;
   a CCTrCH signal to interference ratio target;
   a guaranteed data rate;
an allowed data rate; and
the dedicated physical channel (DPCH) information.

95. The method according to claim 94, wherein the DPCH information includes:
   a list of DPCH timeslot information;
a repetition period value; and
   a repetition length value.

96. The method according to claim 95, wherein the DPCH timeslot information includes:
a timeslot number;
a midamble shift and burst type;
a transport format combination indicator presence; and
code information.

97. The method according to claim 96, wherein the code information includes:
   a channelized code;
a code usage status;
a dedicated physical channel identification; and
a code signal to interference target.

98. The method according to claim 91, wherein the code vector information includes:
   uplink code vector information, including:
   a code identification;
a code block indication; and
a code usage status; and
downlink code vector information, including:
a code identification; and
a code usage status.

99. The method according to claim 84, wherein the creating step includes:
   filling both uplink (UL) and downlink CCTrCH information with physical channel information to the response message;
   filling dedicated channel information to the response message;
   filling UL timeslot ISCP information to the response message; and
   filling power control information to the response message.

100. The method according to claim 99, wherein the CCTrCH information includes:
a CCh identification; and
dedicated physical channel (DPCH) information.

101. The method according to claim 100, wherein the DPCH information includes:
  a list of timeslot information;
a repetition period value; and
a repetition length value.

102. The method according to claim 101, wherein the timeslot information includes:
  the timeslot number;
a midamble shift and burst type;
a transport format combination indicator presence; and
a list of code information.

103. The method according to claim 102, wherein the code information includes:
  a channelized code; and
  a DPCH identification.

104. The method according to claim 99, wherein the UL timeslot ISCP information includes:
  a timeslot number and
  a timeslot ISCP.

105. The method according to claim 99, wherein the power control information includes:
an uplink (UL) target signal to interference ratio (SIR);
a maximum UL SIR;
a minimum UL SIR;
an initial downlink (DL) transmission power;
a maximum DL transmission power; and
a minimum DL transmission power.

106. A method of implementing fast dynamic channel allocation call admission control (CAC) for radio link reconfiguration in a wireless communication system, comprising the steps of:
receiving a radio link reconfiguration request message to initiate the CAC function;
processing the request message;
obtaining Node B measurements from a centralized database;
defining a local data structure to store measurement data;
retrieving a list of available timeslots and a list of code sets from the centralized database;
retrieving wireless transmit/receive unit (WTRU) capability information from the centralized database;
allocating the code sets to the available timeslots in a timeslot sequence;
updating the new WTRU information with new allocation information in the centralized database; and
sending a response message with the results of the code allocation process.

107. The method according to claim 106, wherein the processing step includes reading WTRU information, WTRU coded composite transport channel information, and dedicated channel information from the request message.

108. The method according to claim 106, wherein the processing step includes reading WTRU measurements from the request message.

109. The method according to claim 108, wherein the WTRU measurements include:
the downlink interference signal code power; and
the downlink primary common control physical channel received signal code power.

110. The method according to claim 106, wherein the retrieving step further includes reading Node B measurements from the centralized database.

111. The method according to claim 110, wherein the Node B measurements include:
  common measurements, including uplink interference signal code power and downlink transmitted carrier power; and
dedicated measurements, including downlink transmitted code power.

112. The method according to claim 106, wherein the local data structure includes a list of cell measurement records.

113. The method according to claim 112, wherein a cell measurement record includes:
  a cell identification; and
  a list of timeslot measurement records.

114. The method according to claim 113, wherein a timeslot measurement record includes:
  a timeslot number;
a timeslot interference signal code power (ISCP);
a timeslot carrier power; and
a list of code measurement records.

115. The method according to claim 114, wherein a code measurement record includes:
  a WTRU identification; and
  a radio link identification;
a dedicated physical channel (DPCH) identification; and
a code transmitted power.

116. The method according to claim 106, wherein the WTRU capability information includes:

uplink WTRU capability information, including:
the maximum number of timeslots per frame; and
the maximum number of uplink physical channels per timeslot;
and
downlink WTRU capability information, including:
the maximum number of timeslots per frame; and
the maximum number of downlink physical channels per frame.

117. The method according to claim 106, wherein the allocating step includes:

checking the availability of a code in the cell;
generating timeslot sequences from the list of available timeslots; and
assigning a code set to a timeslot sequence to find a solution, wherein a successful assignment is a solution.

118. The method according to claim 117, wherein the allocating step further includes:

calculating an interference signal code power (ISCP) value for the solution; and

selecting the solution having the lowest weighted ISCP value as an optimal solution.

119. The method according to claim 106, wherein the updating step includes:

recording coded composite transport channel (CCTrCH) information in the centralized database;
recording new physical channel allocation information in the centralized database; and
updating code vector information in the centralized database.

120. The method according to claim 119, wherein the CCTrCH information includes:
a CCTrCH identification;
a CCTrCH status;
a CCTrCH signal to interference ratio target;
a guaranteed data rate;
an allowed data rate; and
the dedicated physical channel (DPCH) information.

121. The method according to claim 120, wherein the DPCH information includes:
a list of DPCH timeslot information;
a repetition period value; and
a repetition length value.

122. The method according to claim 121, wherein the DPCH timeslot information includes:
a timeslot number;
a midamble shift and burst type;
a transport format combination indicator presence; and
code information.

123. The method according to claim 122, wherein the code information includes:
a channelization code;
a code usage status;
dedicated physical channel identification; and
a code signal to interference target.
124. The method according to claim 119, wherein the code vector information includes:
   an uplink code vector information, including:
   a code identification;
   a code block indication;
   a code usage status; and
   a downlink code vector information, including:
   a code identification; and
   a code usage status.

125. The method according to claim 106, wherein the sending step includes filling the response message with power control information and physical channel allocation information.

126. The method according to claim 125, wherein the power control information includes:
   an initial downlink (DL) transmission power;
   a maximum DL transmission power;
   a minimum DL transmission power;
   a maximum uplink (UL) SIR; and
   a minimum UL SIR.

127. The method according to claim 125, wherein the physical channel information includes:
   the dedicated physical channel (DPCH) information;
   a repetition period value, and
   a repetition length value.

128. The method according to claim 127, wherein the DPCH information includes DPCH timeslot information.
129. The method according to claim 128, wherein the DPCH timeslot information includes:
   the timeslot number;
   the midamble shift and burst type;
   the transport format combination indicator presence; and
   a list of code information.

130. The method according to claim 129, wherein the code information includes:
   the DPCH identification; and
   the channelization code.
PRE-CODE ALLOCATION PROCESS
* READ IN WTRU MEASUREMENTS FROM MESSAGE
* READ IN WTRU CCTrCH INFO AND DCH INFO FROM MESSAGE
* READ IN WTRU CAPABILITY INFO FROM MESSAGE
* READ IN NODE B MEASUREMENTS FROM RRC SHARED CELL DATABASE
* FIND THE AVAILABLE TIMESLOTS FROM RRM CELL DATABASE
* GET THE CODE SETS FROM OAM RRM TABLE DATABASE

CODE ALLOCATION PROCESS
* CHECK THE CODE AVAILABILITY IN THE CELL
* GENERATE TIMESLOT SEQUENCES
* FIND ASSIGNMENT SOLUTION FOR THE CODE SET FOR A TIMESLOT SEQUENCE
* SELECT THE SOLUTION THAT HAS THE LOWEST WEIGHTED ISCP AS THE OPTIMAL SOLUTION

POST-CODE ALLOCATION PROCESS
* CREATE WTRU ENTITY IN RRM WTRU DATABASE
* RECORD WTRU INFO FROM MESSAGE TO RRM WTRU DATABASE
* RECORD PHYSICAL CHANNEL INFO TO RRM WTRU DATABASE
* FILL THE POWER CONTROL INFO INTO SIGNAL MESSAGE
* FILL PHYSICAL CHANNEL INFO INTO SIGNAL MESSAGE

FIG. 1
START WITH INPUT RL SETUP REQUEST MESSAGE

GET PARAMETERS FROM RL SETUP REQUEST MESSAGE

GET THE ENTRY ID OF RRM CELL DATABASE

WTRU MEASUREMENT AVAILABLE?

CHECK IF ALL DCHS ARE NRT

ARE ALL DCHS NRT?

ALLOCATE LOW RATE TEMP-DCH

SUCCESSFUL RESOURCE ALLOCATION?

SELECT FIRST DL CCTrCH

GET SERVICE TYPE FOR CURRENT CCTrCH

C

D

A

B

200

202

204

206

208

210

212

218

220

222

228

230

232
FIG. 2c

1. SELECT NEXT CCH
   - YES: MORE CCH?
   - NO: SELECT FIRST UL CCH

2. IS UL CONSIDERED?
   - YES: CREATE A WTRU ENTITY AND RECORD PHYSICAL CHANNEL INFO IN RRM WTRU DATABASE
   - NO: FILL PHYSICAL CHANNEL INFO AND POWER CONTROL INFO IN RL SETUP RESPONSE MESSAGE

3. S = RNCRRM_FDCA_SUCCESS
   - S = RNCRRM_FDCA_FAILURE

4. END
FIG. 3a

START WITH CODE SETS AND AVAILABLE TIMESLOTS

FIRST CODE SET (i = 0)

CHECK CODE AVAILABILITY IN THE CELL

SELECT NEXT CODE SET (i = i+1)

MORE CODE SETS?

YES

NO

CALCULATE REQUIRED RESOURCE UNITS FOR THIS CCfCH

GENERATE TIMESLOT SEQUENCES

SELECT FIRST TIMESLOT SEQUENCE (j = 0)
FIG. 3b

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B

350

LINK DIRECTION?

DL

UL

352

FIND ASSIGNMENT SOLUTION (TIMESLOTS AND CODES) FOR i-th DL CODE SET AT j-th TIMESLOT SEQUENCE

354

FIND ASSIGNMENT SOLUTION (TIMESLOTS AND CODES) FOR i-th UL CODE SET AT j-th TIMESLOT SEQUENCE

356

FIND SOLUTION?

NO

358

RECORD THE OPTIMAL SOLUTION WITH LOWEST WEIGHTED ISCP

360

NEXT TS SEQUENCE?

YES

SELECT NEXT TIMESLOT SEQUENCE (j = j + 1)

NO

362

364

FIND THE OPTIMAL SOLUTION?

YES

s = RNCRRM_FDCA_SUCCESS

END

366

NO

316

s = RNCRRM_FDCA_NOSOLUTION

314

A
Figure 4

**Pre-Code Allocation Process**
- Get Node B Measurements from RRC Shared Cell Database
- Get Cell Configuration Info from RRM Cell Database
- Obtain WTRU Capability Info from RRM WTRU Database
- Determine the Candidate CCTrCH to be reassigned
- Calculate WTRU Pathloss
- Determine the Candidate Code Set to be reassigned
- Get Available Timeslots

**Code Allocation Process**
- Check the Code Availability in the Cell
- Check Tx Power of the Candidate Timeslot
- Check if ISCP of Other Timeslots is lower than that of Given Timeslot
- Generate Timeslot Sequences
- Find Assignment Solution for the Code Set for a Timeslot Sequence
- Select the Solution that has the Lowest Weighted ISCP as the Optimal Solution

**Post-Code Allocation Process**
- Record Physical Channel Info to RRM WTRU Database
- Fill Physical Channel Info into Physical Channel Reconfiguration Request Message
START WITH INPUTS FROM TRIGGER SIGNAL

GET THE ENTRY ID OF RRM CELL DATABASE

GET MEASUREMENTS FROM SHARED CELL DATABASE

DETERMINE THE LINK DIRECTION OF TIMESLOT

DETERMINE THE CANDIDATE CCTrCH TO BE REASSIGNED

FIND CANDIDATE CCTrCH?

RETRIEVE WTRU CAPABILITY FROM WTRU DATABASE

CALCULATE PATHLOSS

DETERMINE THE CANDIDATE CODE SET TO BE REASSIGNED

FIG. 5a
FIG. 5b

B

524

FIND THE CODE SET?

YES

NO

526

GET AVAILABLE TIMESLOTS FOR CODES TO BE REASSIGNED

528

ANY TIMESLOT AVAILABLE?

NO

YES

530

ALLOCATE PHYSICAL CHANNELS FOR CCTRL

532

RESOURCE ALLOCATION SUCCESSFUL?

NO

YES

534

RECORD PHYSICAL CHANNEL INFO TO RRM WTRU DATABASE

536

RECORD PHYSICAL CHANNEL INFO TO PHYSICAL CHANNEL RECONFIGURATION REQUEST MESSAGE

538

s = RNCRRM_FDCA_SUCCESS

514

s = RNCRRM_ESCAPE_FAILURE

516

END
START WITH CODE SETS, AVAILABLE TIMESLOTS, AND FDCA TYPE

FIRST CODE SET (i = 0)

NEXT CODE SET (i = i + 1)

CHECK CODE AVAILABILITY IN THE CELL

CHECK IF Tx POWER OF THE CANDIDATE TIMESLOT IS LARGER THAN THE MINIMUM Tx POWER

CHECK IF Tx POWER OF THE CANDIDATE TIMESLOT IS LARGER THAN THE MINIMUM Tx POWER

CALCULATE REQUIRED RESOURCE UNITS FOR THIS CCTrCH

GENERATE TIMESLOT SEQUENCES

FIRST TIMESLOT SEQUENCE (i = 0)

MORE CODE SETS?

CODE AVAILABLE?

FDCA TYPE?

RBSETUP

BACKGROUND

FIG. 6
START

GET THE ENTRY ID OF RRM CELL DATABASE

GET MEASUREMENTS FROM RRC SHARED CELL DATABASE

DETERMINE THE CANDIDATE TIMESLOTS (ONE UL AND ONE DL) FOR REASSIGNMENTS

FIND THE TIMESLOTS FOR REASSIGNMENTS?

LINKDIR = DL

GET AVAILABLE TIMESLOTS

ANY TIMESLOT AVAILABLE?

UPDATE AVAILABLE TIMESLOTS BY EXCLUDING THE CANDIDATE TIMESLOT

DETERMINE THE CANDIDATE CODE SETS TO BE REASSIGNED

FIG. 8a
FIG. 8b

826
FIND CODE SET?

828
RETRIEVE WTRU CAPABILITY FROM WTRU DATABASE

830
CALCULATE PATHLOSS

832
ALLOCATE PHYSICAL CHANNELS FOR CCMCH

834
SUCCESSFUL RESOURCE ALLOCATION?

836
YES

838
LINKDIR = UL?

840
YES

842
SET THE FLAG INDICATING TWO WTRUS TO BE REASSIGNED

844
RECORD PHYSICAL CHANNEL INFO TO RRM WTRU DATABASE

846
RECORD PHYSICAL CHANNEL INFO TO PHYSICAL CHANNEL RECONFIGURATION REQUEST MESSAGE

848
S = RNCRRM_FDCA_SUCCESS

812
S = RNCRRM_BKGROUND_FAILURE

814
END
START WITH INPUT RL ADDITION REQUEST MESSAGE

GET WTRU ID, NEW CELL ID, AND RL ID FROM RL ADDITION REQUEST MESSAGE

GET THE ENTRY ID OF THE NEW CELL FROM THE CELL DATABASE

GET NODE B MEASUREMENTS FOR THE NEW CELL FROM SHARED CELL DATABASE AND STORE LOCALLY

RETrieve CCTeCHs INFO AND DCHs INFO FROM RRM WTRU DATABASE

WTRU MEASUREMENT AVAILABLE?

NO

RETRIEVE SERVICE TYPE FROM RRM WTRU INFO

ARE ALL DCHs NRT?

YES

ALLOCATE LOW RATE TEMP-DCH

SUCCESSFUL RESOURCE ALLOCATION?

NO

SELECT FIRST DL CCTeCH

RETRIEVE WTRU CAPABILITY FROM RRM WTRU DATABASE

GET SERVICE TYPE FOR CCTeCH

FIG. 10a
FIG. 10c

E

SELECT NEXT CCTrCH

D

MORE CCTrCH?

NO

SELECT FIRST UL CCTrCH

F

IS UL CONSIDERED?

YES

RECORD NEW RL INFO AND PHYSICAL CHANNEL INFO IN RRM WTRU DATABASE

1026

FILL CCTrCHs INFO, DCHs INFO, DPCHs INFO, UL TIMESLOT INFO, AND POWER CONTROL INFO IN RL ADDITION RESPONSE MESSAGE

1028

\[ S = \text{RNCRRM\_FDCA\_SUCCESS} \]

1030

\[ S = \text{RNCRRM\_FDCA\_FAILURE} \]

1020

END

1018

B

1056

1054

1058

1060
**Pre-Code Allocation Process**

- Retrieve WTRU info from signal message
- Retrieve WTRU capability info from RRM WTRU database
- Get WTRU and Node B measurements
- Find the available timeslots from RRM cell database
- Get the code sets from OAM RRM table database

**Code Allocation Process**

- Check the code availability in the cell
- Generate timeslot sequences
- Find assignment solution for the code set for a timeslot sequence
- Select the solution that has the lowest weighted ISCP as the optimal solution

**Post-Code Allocation Process**

- Record physical channel info in RRM WTRU database
- Fill physical channel info and power control info into signal message

FIG. 11
FIG. 12

START WITH INPUT RL RECONFIGURATION PREPARE MESSAGE

GET WTRU ID AND RL ID FROM RL RECONFIGURATION PREPARE MESSAGE AND FIND CELL ID FROM WTRU DATABASE

GET THE ENTRY ID OF RRM CELL DATABASE

DEFINE A DATA STRUCTURE TO STORE MEASUREMENTS LOCALLY

GET NODE B MEASUREMENTS FROM SHARED CELL DATABASE AND STORE LOCALLY

WTRU MEASUREMENTS AVAILABLE?

CHECK IF ALL DCHS ARE NRT

ARE ALL DCHS NRT?

ALLOCATE PHYSICAL CHANNELS

ALLOCATE PHYSICAL CHANNELS LOW RATE TEMP-DCH

SUCCESS?

s = RNCRRM_FDCA_SUCCESS

END

s = RNCRRM_FDCA_FAILURE
START WITH INPUTS RL RECONFIGURATION PREPARE MESSAGE, MEASUREMENT DATA STRUCTURE

GET WTRU ID AND RL ID FROM RL RECONFIGURATION PREPARE MESSAGE

SELECT FIRST DL CCH

RETrieve WTRU CAPABILITIES FROM WTRU DATABASE

GET SERVICE TYPE FOR CCH

FIG. 13a
FIG. 13c

1334

SELECT NEXT CCTrCH

1332

MORE CCTrCH?

1336

IS UL CONSIDERED?

1338

SELECT FIRST UL CCTrCH

UPDATE WTRU INFO AND PHYSICAL CHANNEL INFO IN RRM WTRU DATABASE

FILL PHYSICAL CHANNEL INFO AND POWER CONTROL INFO IN RL RECONFIGURATION READY MESSAGE

S = RNCRRM_FDCA_SUCCESS

S = RNCRRM_FDCA_FAILURE

END

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