What is claimed is:

1. A method comprising:

receiving, at a serving node, a request to set one or more power saving mode (PSM) settings, wherein the request initially originates from an application server directed to a core network associated with the serving node by way of an interface configured for enabling the application server to send the request, and wherein the request comprises one or more parameters or information for the application server to enable or disable PSM functionality in a wireless transmit and receive unit (WTRU) using the PSM settings; and

triggering, at the serving node, the PSM functionality in a wireless transmit and receive unit (WTRU) based on the one or more PSM settings such that the PSM functionality is enabled or disabled by applying at least one or more of the parameters or information to the PSM settings received from the application server in the request.

2. The method of claim 1, wherein the one or more PSM settings comprise at leat one of the following:

a setting to activate the PSM functionality in the WTRU; and

a setting to deactivate the PSM in the WTRU; and

a timer for reachability of the WTRU.

3. The method of claim 2, wherein the serving node is configured to apply an active time to the timer configured to control the PSM functionality including an indication of how long the WTRU is reachable.

4. The method of claim 3, wherein the active time is included in the one or more parameters or information received from the application server.

5. The method of claim 3,wherein upon expiration of the active time applied to the timer the WTRU is configured to enter PSM.

6. The method of claim 1, wherein the request or the one or more PSM settings from the application comprises an indication whether the serving node should or should not take one or more proactive measures or actions.

7. The method of claim 6, wherein the proactive measures or actions comprise one or more actions for enabling or disabling the PSM functionality in the WTRU.

8. The method of claim 7, wherein the one or more actions comprise one or more of the following:

a proactive measure or action configured to force a change in PSM setting in the WTRU in idle mode by sending a page to the WTRU to force the WTRU to enter connected mode and thereafter change a PSM setting;

a proactive measure or action configured to force a change in a PSM setting in the WTRU by paging the WTRU with the international mobile subscriber identity (IMSI) of the WTRU configured to force the WTRU to reattach to the system;

a proactive measure or action configured to page the WTRU with a system architecture (SAE)-temporary mobile subscriber identity (S-TMSI);

a proactive measure or action configured to page configured to page the WTRU with S-TMSI to trigger the WTRU to send an (Extended) Service Request message; or

a proactive measure or action configured to configured to force the WTRU to send a tracking area update or attach request.

9. The method of claim 7, wherein the serving node is configured to start a timer with a predetermined value and, when this timer expires, the serving node then activates one or more of the predetermined proactive measures.

10. The method of claim 7, wherein if there is no indication of a least one of the proactive measures or actions, the serving node is configured to wait for a next tracking area update of the WTRU to enforce the PSM setting.

11. The method of claim 10, wherein if one or more of the proactive measures or action are invoked or if the timer that guards the proactive measure expires, the serving node is further configured to apply or perform the proactive measures or actions to enforce the PSM settings.

12. The method of claim 1, further comprising sending, via the serving node, a message to the application server indicating that the WTRU has terminated the PSM functionality.

13. The method of claim 1, wherein the core network comprises one or more of the following:

a global system for mobile communications (GSM);

a global system for mobile communications radio access network (GERAN);

an enhanced data rates for GSM Evolution (EDGE);

a GSM EDGE radio access network (GERAN);

a universal terrestrial radio access network (UTRAN);

an evolved universal terrestrial radio access (eUTRAN);

a first responder network authority (FirstNet) radio access network;

a cellular network employing wideband code division multiple access (WCDMA);

a high speed packet access (HSPA) network;

a vehicle ad hoc network;

a worldwide interoperability for microwave access (WiMAX) network;

a CDMA2000, CDMA2000 1X, CDMA2000 EV-DO, Interim Standard 2000 (IS-2000), Interim Standard 95 (IS-95), or Interim Standard 856 (IS-856) radio access network.

14. A serving node configured at least in part to:

receive a request to set one or more power saving mode (PSM) settings, wherein the request initially originates from an application server directed to a core network associated with the serving node by way of an interface configured for enabling the application server to send the request, and wherein the request comprises one or more parameters or information

for the application server to enable or disable PSM functionality in a wireless transmit and receive unit (WTRU) using the PSM settings; and

trigger the PSM functionality in a wireless transmit and receive unit (WTRU) based on the one or more PSM settings such that the PSM functionality is enabled or disabled by applying at least one or more of the parameters or information to the PSM settings received from the application server in the request.

15. The serving node of claim 14, wherein the one or more PSM settings comprise at leat one of the following:

a setting to activate the PSM functionality in the WTRU; and

a setting to deactivate the PSM in the WTRU; and

a timer for reachability of the WTRU.

16. The serving node of claim 15, further configured to apply an active time to the timer configured to control the PSM functionality including an indication of how long the WTRU is reachable.

17. The serving node of claim 16, wherein the active time is included in the one or more parameters or information received from the application server.

18. The serving node of claim 16,wherein upon expiration of the active time applied to the timer the WTRU is configured to enter PSM.

19. The serving node of claim 15, wherein the request or the one or more PSM settings from the application comprises an indication whether the serving node should or should not take one or more proactive measures or actions.

20. The serving node of claim 19, wherein the proactive measures or actions comprise one or more actions for enabling or disabling the PSM functionality in the WTRU.

21. The serving node of claim 20, wherein the one or more actions comprise one or more of the following:

a proactive measure or action configured to force a change in PSM setting in the WTRU in idle mode by sending a page to the WTRU to force the WTRU to enter connected mode and thereafter change a PSM setting;

a proactive measure or action configured to force a change in a PSM setting in the WTRU by paging the WTRU with the international mobile subscriber identity (IMSI) of the WTRU configured to force the WTRU to reattach to the system;

a proactive measure or action configured to page the WTRU with a system architecture (SAE)-temporary mobile subscriber identity (S-TMSI);

a proactive measure or action configured to page configured to page the WTRU with S-TMSI to trigger the WTRU to send an (Extended) Service Request message; or

a proactive measure or action configured to configured to force the WTRU to send a tracking area update or attach request.

22. The serving node of claim 20, further configured to configured to start a timer with a predetermined value and, when this timer expires, the serving node then activates one or more of the predetermined proactive measures.

23. The serving node of claim 20, wherein if there is no indication of a least one of the proactive measures or actions, the serving node is configured to wait for a next tracking area update of the WTRU to enforce the PSM setting.

24. The serving node of claim 10, wherein if one or more of the proactive measures or action are invoked or if the timer that guards the proactive measure expires, the serving node is further configured to apply or perform the proactive measures or actions to enforce the PSM settings.

25. The serving node of claim 15, further comprising sending, via the serving node, a message to the application server indicating that the WTRU has terminated the PSM functionality.

26. The serving node of claim 15, wherein the core network comprises one or more of the following:

a global system for mobile communications (GSM);

a global system for mobile communications radio access network (GERAN);

an enhanced data rates for GSM Evolution (EDGE);

a GSM EDGE radio access network (GERAN);

a universal terrestrial radio access network (UTRAN);

an evolved universal terrestrial radio access (eUTRAN);

a first responder network authority (FirstNet) radio access network;

a cellular network employing wideband code division multiple access (WCDMA);

a high speed packet access (HSPA) network;

a vehicle ad hoc network;

a worldwide interoperability for microwave access (WiMAX) network;

a CDMA2000, CDMA2000 1X, CDMA2000 EV-DO, Interim Standard 2000 (IS-2000), Interim Standard 95 (IS-95), or Interim Standard 856 (IS-856) radio access network.

27. A method comprising:

receiving, at an interface, a request to set one or more power saving mode (PSM) settings, wherein the request originates from an application server and is directed to a core network, and wherein the request comprises one or more parameters or information for the application server to enable or disable PSM functionality in a wireless transmit and receive unit (WTRU) using the PSM settings; and

verifying, at the interface, the request; and

sending, from the interface, the request including the one or more parameters or information and additional information generated by the interface to the core network, wherein the core network is configured to apply at least one or more of the parameters or

information or the additional information to the PSM settings to enable or disable the PSM functionality of the WTRU.

28. The method of claim 27, wherein the one or more parameters or information comprises an active time configured to control the PSM functionality including an indication of how long the WTRU is to be reachable, and wherein the core network is configured to apply the active time to a timer associated with the PSM settings to keep the WTRU reachable for the active time.

29. The method of claim 28, wherein upon expiration of the active time the WTRU is configured to enter PSM.

30. The method of claim 27, wherein the one or more parameters or information comprises an indication whether the core network should or should not take one or more proactive measures or actions.

31. The method of claim 30, wherein the proactive measures or actions comprise one or more actions for enabling and disabling the PSM functionality in the WTRU.

32. The method of claim 31, wherein the one or more actions comprise one or more of the following:

a proactive measure or action configured to force a change in PSM setting in the WTRU in idle mode by sending a page to the WTRU to force the WTRU to enter connected mode and thereafter change a PSM setting;

a proactive measure or action configured to force a change in a PSM setting in the WTRU by paging the WTRU with the international mobile subscriber identity (IMSI) of the WTRU configured to force the WTRU to reattach to the system;

a proactive measure or action configured to page the WTRU with a system architecture (SAE)-temporary mobile subscriber identity (S-TMSI);

a proactive measure or action configured to page configured to page the WTRU with S-TMSI to trigger the WTRU to send an (Extended) Service Request message; or

a proactive measure or action configured to configured to force the WTRU to send a tracking area update or Attach Request.

33. The method of claim 31, wherein the core network is configured to start a timer with a predetermined value and, when this timer expires, the core network then activates one or more of the predetermined proactive measures.

34. The method of claim 33, wherein if there is no indication in the request for a predetermined proactive measure, the core network is configured to wait for a next tracking area update of the WTRU to enforce the PSM setting.

35. The method of claim 34, wherein if one or more predetermined proactive measures are invoked or if the timer that guards the proactive measure expires, the core network is configured to take a proactive measure to enforce the PSM settings.

36. The method of claim 27, further comprising sending from the core network, via the interface, a message to the application server indicating that the WTRU has enabled or disabled the PSM functionality or modified the PSM settings.

37. The method of claim 27, wherein the core network comprises one or more of the following:

a global system for mobile communications (GSM);

a global system for mobile communications radio access network (GERAN);

an enhanced data rates for GSM Evolution (EDGE);

a GSM EDGE radio access network (GERAN);

a universal terrestrial radio access network (UTRAN);

an evolved universal terrestrial radio access (eUTRAN);

a first responder network authority (FirstNet) radio access network;

a cellular network employing wideband code division multiple access (WCDMA);

a high speed packet access (HSPA) network;

a vehicle ad hoc network;

a worldwide interoperability for microwave access (WiMAX) network;

a CDMA2000, CDMA2000 1X, CDMA2000 EV-DO, Interim Standard 2000 (IS-2000), Interim Standard 95 (IS-95), or Interim Standard 856 (IS-856) radio access network.

38. The method of claim 27, wherein the interface comprises a Service Capability Exposure Function (SCEF).

39. A device comprising an interface, the interface configured in part to:

receive a request to set one or more power saving mode (PSM) settings, wherein the request originates from an application server and is directed to a core network, and wherein the request comprises one or more parameters or information for the application server to enable or disable PSM functionality in a wireless transmit and receive unit (WTRU) using the PSM settings; and

verify the request; and

send the request including the one or more parameters or information and additional information generated by the interface to the core network, wherein the core network is configured to apply at least one or more of the parameters or information or the additional information to the PSM settings to enable or disable the PSM functionality of the WTRU.

40. The device of claim 39, wherein the one or more parameters or information comprises an active time configured to control the PSM functionality including an indication of how long the WTRU is to be reachable, and wherein the core network is configured to apply the active time to a timer associated with the PSM settings to keep the WTRU reachable for the active time.

41. The device of claim 40, wherein upon expiration of the active time the WTRU is configured to enter PSM.

42. The device of claim 39, wherein the one or more parameters or information comprises an indication whether the core network should or should not take one or more proactive measures or actions.

43. The device of claim 42, wherein the proactive measures or actions comprise one or more actions for enabling and disabling the PSM functionality in the WTRU.

44. The device of claim 43, wherein the one or more actions comprise one or more of the following:

a proactive measure or action configured to force a change in PSM setting in the WTRU in idle mode by sending a page to the WTRU to force the WTRU to enter connected mode and thereafter change a PSM setting;

a proactive measure or action configured to force a change in a PSM setting in the WTRU by paging the WTRU with the international mobile subscriber identity (IMSI) of the WTRU configured to force the WTRU to reattach to the system;

a proactive measure or action configured to page the WTRU with a system architecture (SAE)-temporary mobile subscriber identity (S-TMSI);

a proactive measure or action configured to page configured to page the WTRU with S-TMSI to trigger the WTRU to send an (Extended) Service Request message; or

a proactive measure or action configured to configured to force the WTRU to send a tracking area update or Attach Request.

45. The device of claim 43, wherein the core network is configured to start a timer with a predetermined value and, when this timer expires, the core network then activates one or more of the predetermined proactive measures.

46. The method of claim 45, wherein if there is no indication in the request for a predetermined proactive measure, the core network is configured to wait for a next tracking area update of the WTRU to enforce the PSM setting.

47. The method of claim 46, wherein if one or more predetermined proactive measures are invoked or if the timer that guards the proactive measure expires, the core network is configured to take a proactive measure to enforce the PSM settings.

48. The device of claim 39, wherein the interface is further configured to send from the core network a message to the application server indicating that the WTRU has enabled or disabled the PSM functionality or modified the PSM settings.

49. The method of claim 39, wherein the core network comprises one or more of the following:

a global system for mobile communications (GSM);

a global system for mobile communications radio access network (GERAN);

an enhanced data rates for GSM Evolution (EDGE);

a GSM EDGE radio access network (GERAN);

a universal terrestrial radio access network (UTRAN);

an evolved universal terrestrial radio access (eUTRAN);

a first responder network authority (FirstNet) radio access network;

a cellular network employing wideband code division multiple access (WCDMA);

a high speed packet access (HSPA) network;

a vehicle ad hoc network;

a worldwide interoperability for microwave access (WiMAX) network;

a CDMA2000, CDMA2000 1X, CDMA2000 EV-DO, Interim Standard 2000 (IS-2000), Interim Standard 95 (IS-95), or Interim Standard 856 (IS-856) radio access network.

50. The method of claim 38, wherein the interface comprises a Service Capability Exposure Function (SCEF).

Claims

1. A method performed by a Service Capability Exposure Function (SCEF) to configured power saving mode (PSM) settings for a WTRU, the method comprising:

receiving, at a SCEF, a request to set one or more PSM settings for a WTRU, the PSM settings comprising a time indicating a period of reachability for the WTRU, and wherein the request initially originates from an application server directed to a core network associated with the SCEF by way of an interface configured for enabling the application server to send the request;

determining a PSM configuration for the WTRU based on the request; and

directing the PSM configuration to the WTRU to set an active timer based on the time indicating the period of reachability for the WTRU, the active timer indicating how long the WTRU is reachable in PSM.

2. The method of claim 1, wherein the one or more PSM settings further comprise an indication to deactivate the PSM for the WTRU.

3. The method of claim 2, wherein the PSM configuration further comprises an indication that the WTRU deactivate PSM.

4. The method of claim 2, wherein the PSM configuration further comprises a time for a tracking area update (TAU) timer.

5. The method of claim 1, further comprising:

determining that the time indicating the period of reachability for the WTRU is below a threshold or outside of a range; and

determining not to direct the PSM configuration to the WTRU.

6. The method of claim 1, further comprising:

determining that the time indicating the period of reachability for the WTRU is above the threshold or within of the range; and

directing the PSM configuration to the WTRU.

7. The method of claim 1, wherein, upon expiration of the active timer, the WTRU is configured to enter PSM.

8. The method of claim 1, further comprising sending, via the SCEF, a message to the application server indicating that the PSM settings have been provided to the WTRU.

9. The method of claim 1, wherein the request or the one or more PSM settings from the application server comprises an indication whether the SCEF should or should not take one or more proactive measures or actions, wherein the proactive measures or actions comprise one or more actions for enabling or disabling the PSM functionality in the WTRU.

10. The method of claim 9, wherein the one or more actions comprise one or more of the following:

a proactive measure or action configured to force a change in PSM setting in the WTRU in idle mode by sending a page to the WTRU to force the WTRU to enter connected mode and thereafter change a PSM setting;

a proactive measure or action configured to force a change in a PSM setting in the WTRU by paging the WTRU with the international mobile subscriber identity (IMSI) of the WTRU configured to force the WTRU to reattach to the system;

a proactive measure or action configured to page the WTRU with a system architecture (SAE)-temporary mobile subscriber identity (S-TMSI);

a proactive measure or action configured to page configured to page the WTRU with S-TMSI to trigger the WTRU to send an (Extended) Service Request message; or

a proactive measure or action configured to configured to force the WTRU to send a tracking area update or attach request.

11. A Service Capability Exposure Function (SCEF) comprising:

a processor configured to:

receive a request to set one or more power saving mode (PSM) settings for a WTRU, the PSM settings comprising a time indicating a period of reachability for the WTRU, and wherein the request initially originates from an application server directed to a core network associated with the SCEF by way of am interface configured for enabling the application server to send the request,

determine a PSM configuration for the WTRU based on the request; and

direct the PSM configuration to the WTRU to set an active timer based on the time indicating the period of reachability for the WTRU, the active timer indicating how long the WTRU is reachable in PSM.

12. The SCEF of claim 11, wherein the one or more PSM settings further comprise an indication to deactivate the PSM for the WTRU.

13. The SCEF of claim 12, wherein the PSM configuration further comprises an indication that the WTRU deactivate PSM.

14. The SCEF of claim 12, wherein the PSM configuration further comprises a time for a tracking area update (TAU) timer.

15. The SCEF of claim 11, wherein the processor is further configured to:

determine that the time indicating the period of reachability for the WTRU is below a threshold or outside of a range; and

determine not to direct the PSM configuration to the WTRU.

16. The SCEF of claim 11, further comprising:

determine that the time indicating the period of reachability for the WTRU is above the threshold or within of the range; and

direct the PSM configuration to the WTRU.

17. The SCEF of claim 11, wherein, upon expiration of the active timer, the WTRU is configured to enter PSM.

18. The SCEF of claim 11, wherein the processor is further configured to send a message to the application server indicating that the PSM settings have been provided to the WTRU.

19. The SCEF of claim 11, wherein the request or the one or more PSM settings from the application server comprises an indication whether the SCEF should or should not take one or more proactive measures or actions, wherein the proactive measures or actions comprise one or more actions for enabling or disabling the PSM functionality in the WTRU.

20. The SCEF of claim 19, wherein the one or more actions comprise one or more of the following:

a proactive measure or action configured to force a change in PSM setting in the WTRU in idle mode by sending a page to the WTRU to force the WTRU to enter connected mode and thereafter change a PSM setting;

a proactive measure or action configured to force a change in a PSM setting in the WTRU by paging the WTRU with the international mobile subscriber identity (IMSI) of the WTRU configured to force the WTRU to reattach to the system;

a proactive measure or action configured to page the WTRU with a system architecture (SAE)-temporary mobile subscriber identity (S-TMSI);

a proactive measure or action configured to page configured to page the WTRU with S-TMSI to trigger the WTRU to send an (Extended) Service Request message; or

a proactive measure or action configured to configured to force the WTRU to send a tracking area update or attach request.