

CLAIMS

1. — A method of wireless communication for a scheduled entity, comprising:
obtaining a medium access control (MAC) control element (CE) from a network,
wherein the MAC CE is configured to indicate any one of a plurality of state transition actions for a secondary cell;
transitioning to a secondary cell dormant state when a state transition action indicated by the MAC CE includes a transition to the secondary cell dormant state; and
operating in the secondary cell dormant state.
2. — The method of claim 1, wherein the transitioning to the secondary cell dormant state comprises transitioning to the secondary cell dormant state from either a secondary cell deactivated state or a secondary cell activated state.
3. — The method of claim 1, wherein the plurality of state transition actions includes the transition to the secondary cell dormant state, a transition to a secondary cell activated state, a transition to a secondary cell deactivated state, and no change in operating state.
4. — The method of claim 1, wherein the MAC CE includes a one-bit value corresponding to the secondary cell, wherein the one-bit value indicates the transition to the secondary cell dormant state.
5. — The method of claim 1, wherein the operating in the secondary cell dormant state comprises refraining from monitoring at least one downlink control channel.
6. — The method of claim 1, wherein the operating in the secondary cell dormant state comprises refraining from transferring data between the scheduled entity and the network.

7. — The method of claim 1, wherein the MAC CE is configured to indicate any one of the plurality of state transition actions for the secondary cell independent of the current operating state of the secondary cell.

8. — An apparatus for wireless communication, comprising:
 at least one processor;
 a transceiver communicatively coupled to the at least one processor; and
 a memory communicatively coupled to the at least one processor,
 wherein the at least one processor is configured to:
 obtain a MAC CE from a network, wherein the MAC CE is configured to indicate any one of a plurality of state transition actions for a secondary cell;
 transition to a secondary cell dormant state when a state transition action indicated by the MAC CE includes a transition to the secondary cell dormant state; and
 operate in the secondary cell dormant state.

9. — A method of wireless communication for a scheduled entity, comprising:
 obtaining a medium access control (MAC) control element (CE) from a network, wherein the MAC CE is configured to control activation and deactivation of a secondary cell;
 transitioning to a secondary cell deactivated state from a secondary cell dormant state when the MAC CE includes an indication to transition to the secondary cell deactivated state;
 operating in the secondary cell deactivated state.

10. — An apparatus for wireless communication, comprising:
 at least one processor;
 a transceiver communicatively coupled to the at least one processor; and
 a memory communicatively coupled to the at least one processor,
 wherein the at least one processor is configured to:
 obtain a medium access control (MAC) control element (CE) from a network, wherein the MAC CE is configured to control activation and deactivation of a secondary cell;
 transition to a secondary cell deactivated state from a secondary cell

dormant state when the MAC CE includes an indication to transition to the secondary cell deactivated state; and

operate in the secondary cell deactivated state.

11. — A method of wireless communication for a scheduled entity, comprising:
obtaining a first medium access control (MAC) control element (CE) and a second MAC CE from a network, wherein the first and second MAC CEs are configured to indicate one of a plurality of state transition actions for a secondary cell, wherein the first MAC CE is configured to control a transition to a secondary cell dormant state and the second MAC CE is configured to control activation and deactivation of the secondary cell;

transitioning to the secondary cell dormant state from either a secondary cell activated state or a secondary cell deactivated state when the first MAC CE includes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell activated state or the secondary cell deactivated state; and

operating in the secondary cell dormant state.

12. — The method of claim 11, wherein the operating in the secondary cell dormant state comprises refraining from monitoring at least one downlink control channel of the secondary cell.

13. — The method of claim 11, wherein the operating in the secondary cell dormant state comprises refraining from transferring data between the scheduled entity and the network.

14. — An apparatus for wireless communication, comprising:

at least one processor;

a transceiver communicatively coupled to the at least one processor; and

a memory communicatively coupled to the at least one processor;

wherein the at least one processor is configured to:

obtain a first medium access control (MAC) control element (CE) from a network, wherein the first and second MAC CEs are configured to indicate one of a plurality of state transition actions for a secondary cell, wherein the first MAC CE is

configured to control a transition to a secondary cell dormant state and the second MAC CE is configured to control activation and deactivation of the secondary cell;

transition to the secondary cell dormant state from either a secondary cell activated state or a secondary cell deactivated state when the first MAC CE includes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell activated state or the secondary cell deactivated state; and

operate in the secondary cell dormant state.

15. — A method of wireless communication for a scheduled entity, comprising:
obtaining a first medium access control (MAC) control element (CE) and a second MAC CE from a network, wherein the first and second MAC CEs are configured to indicate one of a plurality of state transition actions for a secondary cell, wherein the first MAC CE is configured to control a transition to a secondary cell dormant state and the second MAC CE is configured to control activation and deactivation of the secondary cell;

transitioning to a secondary cell activated state from the secondary cell dormant state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell activated state;

transitioning to a secondary cell deactivated state from the secondary cell dormant state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell deactivated state; and

operating in the secondary cell activated state based on the transition to the secondary cell activated state or operating in the secondary cell deactivated state based on the transition to the secondary cell deactivated state.

16. — An apparatus for wireless communication, comprising:

at least one processor;

a transceiver communicatively coupled to the at least one processor; and

a memory communicatively coupled to the at least one processor,

wherein the at least one processor is configured to:

obtain a first medium access control (MAC) control element (CE) and a

second MAC CE from a network, wherein the first and second MAC CEs are configured to indicate one of a plurality of state transition actions for a secondary cell, wherein the first MAC CE is configured to control a transition to a secondary cell dormant state and the second MAC CE is configured to control activation and deactivation of the secondary cell;

transition to a secondary cell activated state from the secondary cell dormant state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell activated state;

transition to a secondary cell deactivated state from the secondary cell dormant state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell deactivated state; and

operate in the secondary cell activated state based on the transition to the secondary cell activated state or operating in the secondary cell deactivated state based on the transition to the secondary cell deactivated state.

17. — A method of wireless communication for a scheduled entity, comprising:

obtaining a first medium access control (MAC) control element (CE) and a second MAC CE from a network, wherein the first and second MAC CEs are configured to indicate one of a plurality of state transition actions for a secondary cell, wherein the first MAC CE is configured to control a transition to a secondary cell dormant state and the second MAC CE is configured to control activation and deactivation of the secondary cell;

transitioning to a secondary cell activated state from a secondary cell deactivated state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell activated state;

transitioning to the secondary cell deactivated state from the secondary cell activated state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell deactivated state; and

~~operating in the secondary cell activated state based on the transition to the secondary cell activated state or operating in the secondary cell deactivated state based on the transition to the secondary cell deactivated state.~~

~~18. — An apparatus for wireless communication, comprising:~~

~~at least one processor;~~

~~a transceiver communicatively coupled to the at least one processor; and~~

~~a memory communicatively coupled to the at least one processor;~~

~~wherein the at least one processor is configured to:~~

~~obtain a first medium access control (MAC) control element (CE) and a second MAC CE from a network, wherein the first and second MAC CEs are configured to indicate one of a plurality of state transition actions for a secondary cell, wherein the first MAC CE is configured to control a transition to a secondary cell dormant state and the second MAC CE is configured to control activation and deactivation of the secondary cell;~~

~~transition to a secondary cell activated state from a secondary cell deactivated state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell activated state;~~

~~transition to the secondary cell deactivated state from the secondary cell activated state when the first MAC CE excludes an indication to transition to the secondary cell dormant state and the second MAC CE includes an indication to transition to the secondary cell deactivated state; and~~

~~operate in the secondary cell activated state based on the transition to the secondary cell activated state or operating in the secondary cell deactivated state based on the transition to the secondary cell deactivated state.~~

~~19. — A method of wireless communication for a scheduled entity, comprising:~~

~~obtaining a medium access control (MAC) control element (CE) from a network, wherein the MAC CE is configured to indicate any one of a plurality of state transition actions for a secondary cell;~~

~~obtaining a first logical channel identifier (LCID) value indicating that the MAC CE is a dormant state activation/deactivation MAC CE based on a one octet format or~~

obtaining a second LCID value indicating that the MAC CE is the dormant state activation/deactivation MAC CE based on a four octet format; and

identifying the MAC CE corresponding to the secondary cell based on the one octet format or the four octet format.

20. — The method of claim 19, wherein the plurality of state transition actions includes a transition to a secondary cell dormant state, a transition to a secondary cell activated state, a transition to a secondary cell deactivated state, and no change in operating state.

21. — The method of claim 19, wherein the MAC CE includes a one-bit value corresponding to the secondary cell.

22. — An apparatus for wireless communication, comprising:

at least one processor;

a transceiver communicatively coupled to the at least one processor; and

a memory communicatively coupled to the at least one processor;

wherein the at least one processor is configured to:

obtain a medium access control (MAC) control element (CE) from a network, wherein the MAC CE is configured to indicate any one of a plurality of state transition actions for a secondary cell;

obtain a first logical channel identifier (LCID) value indicating that the MAC CE is a dormant state activation/deactivation MAC CE based on a one octet format or obtaining a second LCID value indicating that the MAC CE is the dormant state activation/deactivation MAC CE based on a four octet format; and

identify the MAC CE corresponding to the secondary cell based on the one octet format or the four octet format.

23. — A method of wireless communication for a scheduled entity, comprising:

receiving a radio resource control (RRC) connection reconfiguration message; the RRC connection reconfiguration message including an indication to add a secondary cell into a secondary cell activated state or into a secondary cell dormant state; and

transitioning directly to the secondary cell activated state or the secondary cell dormant state based on the indication.

24. — An apparatus for wireless communication, comprising:

at least one processor;

a transceiver communicatively coupled to the at least one processor; and

a memory communicatively coupled to the at least one processor;

wherein the at least one processor is configured to:

receive a radio resource control (RRC) connection reconfiguration message, the RRC connection reconfiguration message including an indication to add a secondary cell into a secondary cell activated state or into a secondary cell dormant state; and

transition directly to the secondary cell activated state or the secondary cell dormant state based on the indication.

25. — A method of wireless communication for a scheduled entity, comprising:

receiving a radio resource control (RRC) connection reconfiguration message,

the RRC connection reconfiguration message including an indication to release a secondary cell; and

releasing the secondary cell from a secondary cell dormant state.

26. — An apparatus for wireless communication, comprising:

at least one processor;

a transceiver communicatively coupled to the at least one processor; and

a memory communicatively coupled to the at least one processor;

wherein the at least one processor is configured to:

receive a radio resource control (RRC) connection reconfiguration message, the RRC connection reconfiguration message including an indication to release a secondary cell; and

release the secondary cell from the secondary cell dormant state.

27. — A method of wireless communication for a scheduled entity, comprising:

configuring a secondary cell deactivation timer; and

— transitioning to a secondary cell deactivated state from a secondary cell dormant state upon expiration of the secondary cell deactivation timer.

28. — ~~An apparatus for wireless communication, comprising:~~
~~at least one processor;~~
~~a transceiver communicatively coupled to the at least one processor; and~~
~~a memory communicatively coupled to the at least one processor,~~
~~wherein the at least one processor is configured to:~~
~~configure a secondary cell deactivation timer; and~~
~~transition to a secondary cell deactivated state from a secondary cell~~
~~dormant state upon expiration of the secondary cell deactivation timer.~~

29. — ~~A method of wireless communication for a scheduled entity, comprising:~~
~~configuring a secondary cell inactivity timer for a secondary cell, wherein the~~
~~secondary cell inactivity timer controls a transition to a secondary cell dormant state~~
~~from a secondary cell activated state; and~~
~~transitioning to the secondary cell dormant state from the secondary cell~~
~~activated state upon expiration of the secondary cell inactivity timer.~~

30. — ~~The method of claim 29, further comprising:~~
~~prioritizing the secondary cell inactivity timer over at least one other timer~~
~~configured for the secondary cell.~~

31. — ~~An apparatus for wireless communication, comprising:~~
~~at least one processor;~~
~~a transceiver communicatively coupled to the at least one processor; and~~
~~a memory communicatively coupled to the at least one processor,~~
~~wherein the at least one processor is configured to:~~
~~configure a secondary cell inactivity timer for a secondary cell, wherein~~
~~the secondary cell inactivity timer controls a transition to a secondary cell dormant state~~
~~from a secondary cell activated state; and~~
~~transition to the secondary cell dormant state from the secondary cell~~
~~activated state upon expiration of the secondary cell inactivity timer.~~

1. An invention not claimed in any divisional application.