

CLAIMS

1. A method for wireless communication, comprising:
 - determining, at a user-equipment (UE), location information associated with an out of coverage area, the location information being determined based on a location of the UE and data from one or more sensors; ~~and~~
 - reporting the location information to a network entity;
 - receiving, at a first radio access network (RAN), a measurement configuration to start a trace of a UE;
 - determining a transition of the UE to an inactive state; and
 - sending one or more messages to coordinate the trace of the UE or indicate that the trace has failed in response to the determination, wherein sending the one or more messages comprises sending a RAN paging message to a second RAN in response to the determination.

2. The method of claim 1, wherein:
 - the out of coverage area corresponds to an area without an available satellite positioning system or cell coverage; and
 - the location of the UE corresponds to a location having an available satellite positioning system or cell coverage.

3. The method of claim 1, wherein the one or more sensors comprise at least one of a gyroscope sensor or compass.

4. The method of claim 1, wherein determining the location information comprises calculating a relative location associated with the out of coverage area with respect to the location of the UE via the data from the one or more sensors.

5. The method of claim 1, wherein the data from the one or more sensors indicates at least one of a direction, altitude, or velocity of the UE at one or more points in time between when the UE is in the out of coverage area to when the UE is at the location.

6. The method of claim 1, wherein the location information is reported to the network entity in accordance with a minimization of drive test (MDT) protocol.

7. A method for wireless communication performed by a first radio access network (RAN), comprising:

receiving, at ~~a the first radio access network (RAN)~~ RAN, a measurement configuration to start a trace of a user-equipment (UE);

determining a transition of the UE to an inactive state; and

sending one or more messages to coordinate the trace of the UE or indicate that the trace has failed in response to the determination, wherein sending the one or more messages comprises sending a RAN paging message to a second RAN in response to the determination.

~~8. The method of claim 7, wherein sending the one or more messages comprises sending a RAN paging message to a second RAN in response to the determination.~~

98. The method of claim 7, wherein the measurement configuration comprises a logged minimization of drive test (MDT) configuration.

109. The method of claim 7, wherein the measurement configuration is received from an access and mobility management function (AMF) network entity, and wherein sending the one or more messages comprises sending a message to the AMF network entity that the trace has failed in response to the determination that the UE is in the inactive state.

~~110.~~ 110. The method of claim 7, further comprising receiving a request from a second RAN to receive context of the UE, wherein sending the one or more messages comprises sending a UE context response message having the context of the UE to the second RAN in response to the reception of the request.

~~12~~11. The method of claim ~~11~~10, wherein the UE context response message indicates the measurement configuration.

~~13~~12. The method of claim 7, further comprising:

updating a previously cached UE context with the measurement configuration;
and

receiving a request from a second RAN for a context of the UE, wherein sending the one or more messages comprises sending a UE context response message having the updated UE context to the second RAN in response to the reception of the request for the context of the UE.

~~14~~13. The method of claim ~~13~~12, wherein:

the method further comprises selecting whether to defer the start of the trace until the UE transitions to a connected state or to trigger the transition to the connected state for the trace; and

if the selection comprises selecting to trigger the transition, the sending of the one or more messages further comprises sending a RAN paging message to the second RAN to trigger the transition of the UE to the connected state prior to the reception of the request for the context of the UE.

~~15~~14. The method of claim ~~14~~13, wherein the selection is based on an indication from an AMF network entity or based a context of the UE.

~~16~~15. The method of claim 7, wherein:

sending the one or more messages comprises sending a message to configure the measurement configuration, the measurement configuration comprising an immediate MDT configuration;

the determination comprises determining that the UE has transitioned to the inactive state while configured with the immediate MDT configuration; and

sending the one or more message comprises sending an indication to an AMF network entity that the trace is deactivated based on the determination.

~~17~~16. The method of claim 7, wherein:

the measurement configuration comprising an immediate MDT configuration;
 the determination comprises determining that the UE has transitioned to the inactive state while configured with the immediate MDT configuration;
 the method further comprises:
 storing the immediate MDT configuration based on the determination;
 and
 configuring the UE to resume the trace after the UE has entered a connected state.

~~18~~17. The method of claim 7, wherein:

sending the one or more messages comprises sending a message to coordinate the trace of the UE with the measurement configuration received from an AMF network entity;
 the measurement configuration comprises a logged MDT configuration; and
 if the UE transitions to the inactive state while configured with the logged MDT configuration, the logged MDT configuration is valid only while the UE is within an area scope set by the AMF network entity in the measurement configuration.

~~19~~18. The method of claim ~~18~~17, further comprising configuring the UE with a RAN notification area (RNA), wherein the logged MDT configuration is further valid only while the UE is within the RNA.

~~20~~19. The method of claim 7, wherein:

the measurement configuration comprises a configuration for a logged MDT;
 and
 the method further comprises configuring the UE with a RAN notification area (RNA) when the UE transitions to the inactive state; and

sending the one or more message comprises sending a radio resource control (RRC) release message to the UE for the transition of the UE to the inactive state, the RRC release message configuring the logged MDT if the UE is within the RNA.

2420. A method for wireless communication, at an access and mobility management function (AMF), comprising:

detecting whether a user-equipment (UE) is in an inactive state;

determining a measurement configuration to start a trace of the UE, the measurement configuration being determined based on whether the UE is in the inactive state;

generating a message comprising the measurement configuration; and

sending the message to a radio access network to (RAN) coordinate the trace.

2221. The method of claim 2420, wherein the measurement configuration comprises a minimization of drive test (MDT) configuration.

2322. The method of claim 7, wherein receiving, at the first RAN, a measurement configuration to start a trace of a user-equipment (UE) comprises~~A method for wireless communication, comprising:~~

receiving a message having a measurement configuration to start a trace of a UE, the UE being in an inactive state;

~~generating another message having the measurement configuration to start the trace; and~~

~~transmitting the other message to the UE.~~

2423. The method of claim 2322, wherein the message comprising the measurement configuration further comprises a trace start message from an access and mobility management function (AMF) network entity, the method further comprising sending a path switch request to the AMF prior to receiving the trace start message.

~~25~~24. The method of claim ~~23~~22, further comprising sending a UE context request message to a radio access network (RAN), wherein:

the message comprising the measurement configuration further comprises a UE context response message received after the UE context request message is sent; and

the method further comprises transmitting a radio resource control (RRC) resume message to the UE after receiving the UE context response message.

~~26~~25. The method of claim ~~25~~24, further comprising:

sending a path switch request to an AMF network entity after transmitting the RRC resume message; and

receiving a trace start message from the AMF network entity after sending the path switch request.

~~27~~26. The method of claim ~~26~~25, wherein the trace start message is received after the other message having the measurement configuration is transmitted to the UE.

~~28~~27. The method of claim ~~25~~24, further comprising:

receiving a RAN paging message; and

transmitting a paging message to the UE to transition the UE from the inactive state to a connected state prior to the transmission of the other message having the measurement configuration.

~~29~~28. The method of claim ~~25~~24, further comprising receiving a RRC resume message from the UE, the UE context request message being sent after the RRC resume message is received.