

CLAIMS

1. A radio access network (RAN) node comprising:

at least one memory; and

at least one processor coupled with the at least one memory and configured to cause the RAN node to:

receive, from a first entity, a first message indicating to the RAN node to collect and report physical layer measurements to at least one data collection entity;

collect the physical layer measurements based on the first message; and

transmit, to the at least one data collection entity, a second message comprising some or all of the physical layer measurements, wherein the some or all of the physical layer measurements are used for model training.

2. The RAN node of claim 1, wherein the first entity comprises an access and mobility management function (AMF), the first message comprises a trace start message, and wherein the trace start message comprises an information element (IE) associated with a data collection configuration indicating to collect and report physical layer measurements, and optionally, wherein the IE associated with the data collection configuration is comprised in a minimization of drive test (MDT) configuration IE.

3. The RAN node of claim 1, wherein the first entity comprises an operations administration and maintenance (OAM) system, and wherein the at least one processor is further configured to cause the RAN node to:

transmit, to an AMF, a cell traffic trace message, and optionally, wherein the cell traffic trace message comprises one of:

a trace recording session reference,

a trace reference,

a cell global identity (CGI) of a serving cell, or

at least one address of the at least one data collection entity.

4. The RAN node of any of claims 1-3, wherein the physical layer measurements comprises

a reference signal received power (RSRP) of a reference signal.

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5. The RAN node of any of claims 1-4, wherein the first message comprises a request for assisting information associated with the physical layer measurements to be collected, wherein the assisting information comprises

an identity of a cell.

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6. The RAN node of any of claims 1-5, wherein the first message comprises a time duration for the data collection.

7. The RAN node of any of claims 1 to 6, wherein the first message comprises a periodicity for the data collection.

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8. The RAN node of any of claims 1-7, wherein the first message comprises at least one address of the at least one data collection entity.

9. The RAN node of any of claims 1-8, wherein the some or all of the physical layer measurements in the second message are conveyed in a container of an encoded format, and/or, wherein UE identification information is removed from the some or all of the physical layer measurements in the second message.

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10. The RAN node of any of claims 1-9, wherein the some or all of the physical layer measurements in the second message are grouped into a plurality of groups corresponding to a plurality of UEs, and wherein each of the plurality of groups has a unique index.

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11. A first entity comprising:

at least one memory; and

at least one processor coupled with the at least one memory and configured to cause the first entity to:

5 obtain information associated with physical layer measurements for model training; and

transmit, to a radio access network (RAN) node, a first message indicating to the RAN node to collect and report the physical layer measurements to at least one data collection entity.

10 12. The first entity of claim 11, wherein the physical layer measurements comprise a reference signal received power, RSRP, of a reference signal.

13. The first entity of claim 11 or 12, wherein the first message comprises a request
15 for assisting information associated with the physical layer measurements to be collected, wherein the assisting information comprises an identity of a cell.

14. The first entity of any of claims 11 to 13, wherein the first message comprises a time duration for the data collection or a periodicity for the data collection.

20 15. A data collection entity comprising:

at least one memory; and

at least one processor coupled with the at least one memory and configured to cause the data collection entity to:

25 receive, from a radio access network (RAN) node, a second message comprising some or all of physical layer measurements; and

use or provide the some or all of the physical layer measurements to a model training entity.