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Minimization of Drive Tests

Technical Product Description

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Contents

1 Minimization of Drive Tests Overview

The MDT feature enables operators to replace traditional drive tests with remote collection of traffic data with the help of UEs in the network. Easier data collection and more extensive data coverage help operators to detect problems, make faster analysis of complaints, and improve user experience.

This document is intended as an introduction to the MDT feature for network operators, network and service planners, as well as system engineers and administrators. It assumes a basic knowledge of datacom and telecom.

The MDT feature is a 3GPP-specified feature. With the feature, the MME transfers user consent for MDT activation from the HSS to the eNodeB. When an operator activates MDT on the OSS, the eNodeB activates the MDT for the UEs. The eNodeB sends MDT trace logs to the TCE. If MDT Mapping is enabled on the MME, the MME associates the MDT trace with the IMEI-TAC. The mapping data can be logged in log files on the MME, streamed to the TCE, or both logged and streamed.

Figure 1 shows the network topology for the MDT feature.

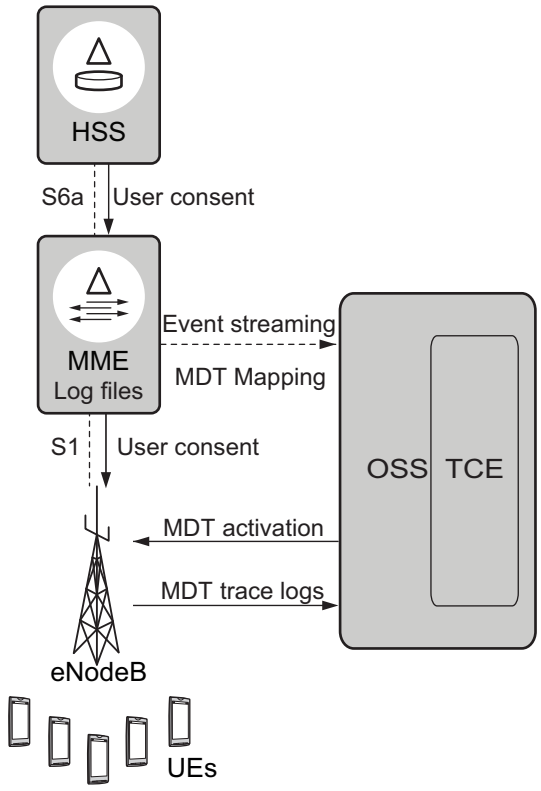

Figure 1 Network Topology for the MDT Feature

Note: The TCE is also called an external system and it can be part of the OSS.

Only management-based MDT is supported on the MME currently.

1.1 Handling of User Consent

As MDT activation can increase power consumption and involve privacy and legal obligations, operators need to get user consent before activating the MDT for a UE.

If the MDT feature is enabled on the MME, the MME supports transferring the user consent from the HSS to the eNodeB. Figure 2 shows an example of how the MME gets and transfers the user consent in preparation for MDT activation.

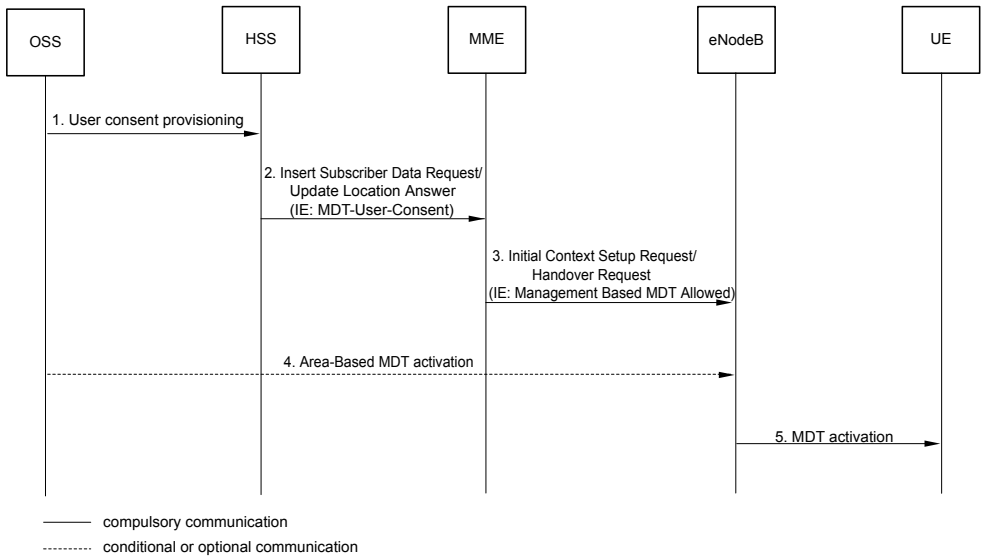

Figure 2 User Consent Transfer procedure

The following steps describe the process:

1. The OSS provides the HSS with user consent of a UE to MDT activation.
2. The HSS stores the user consent. If the UE is attached to the network, the HSS informs the MME of the user consent during the Insert Subscriber Data procedure. The `Insert Subscriber Data Request` message carries the `MDT-User-Consent` IE.

   If the UE is not attached, the HSS informs the MME of the user consent by Update Location during the next mobility procedure. The `MDT-User-Consent` IE is carried in the `Update Location Answer` message.

Note: The MDT-User-Consent IE has two values: CONSENT_NOT_GIVEN (0) and CONSENT_GIVEN (1).

If the MDT-User-Consent IE is not present in the Update Location Answer message, it indicates that the UE has not given consent.

If the MDT-User-Consent IE is not present in the Insert Subscriber Data Request message, it indicates that the MDT-User-Consent IE value has not been modified.

3. If the UE with the user consent is a home subscriber, the MME transfers the user consent to the eNodeB during the UE context setup procedure. The Management Based MDT Allowed IE is carried in an Initial Context Setup Request or Handover Request message.
4. An area-Based MDT trace is activated on the OSS.
5. The eNodeB checks user consent information and activates MDT measurements of the UE with user consent.

   Note: If the MDT feature is disabled, the MME stores the user consent and sends it to the eNodeB in certain procedures when the MDT feature is enabled.

1.2 MDT Mapping

MDT Mapping associates an MDT trace ID from the eNodeB with an IMEI-TAC. If the anonymization at the eNodeB indicates that the IMEI-TAC is required, the eNodeB sends the MME a Cell Traffic Trace message carrying information about the MDT trace. The MME obtains the trace ID from the Cell Traffic Trace message and provides the IMEI-TAC.

MDT Mapping is enabled when logging, streaming, or both logging and streaming of the MDT Mapping data are enabled. The logging function is controlled by the log_mdt_mapping parameter and the streaming function is controlled by the stream_mdt_mapping parameter.

When the logging function is enabled, MDT Mapping log files are created on the MME. When the streaming function is enabled, MDT Mapping events are streamed in real time to a TCE for post-processing.

For more information about MDT Mapping logs, see MDT Mapping Log.

2 Configuration Guidelines

Operators need to configure a connection between the MME and a TCE server before enabling streaming of MDT Mapping data.

For detailed information about how to configure the MDT feature, see Configuring Minimization of Drive Tests.

For information about CLI commands used to configure a TCE server, see MDT Mapping (CLI).

3 Operation and Maintenance

3.1 Parameters

To display the configuration classes and parameters related to the MDT feature, use the get_config_area CLI command for the Mdt configuration area.

3.2 Alarms and Events

The following alarms are valid for the MDT feature:

— mdtmCommunicationFailure

— mdtmStreamBufferOverflow

3.3 Logs

The MDT Mapping events are logged in the MDT Mapping log.

4 Compliance

The MME supports MDT in accordance with the following SoCs:

- SoC with 3GPP TS 29.272
- SoC with 3GPP TS 32.422
- SoC with 3GPP TS 32.423
- SoC with 3GPP TS 36.413