

MTAS Location Based Number Analysis Management Guide

MTAS

USER GUIDE

Copyright

© Ericsson AB 2016. All rights reserved. No part of this document may be reproduced in any form without the written permission of the copyright owner.

Disclaimer

The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. Ericsson shall have no liability for any error or damage of any kind resulting from the use of this document.

Trademark List

All trademarks mentioned herein are the property of their respective owners. These are shown in the document Trademark Information.



Contents

1	Introduction	1
1.1	Prerequisites	1
2	Overview	3
2.1	Subfunctions	4
2.2	Interaction with Other Services	5
3	LNA Configuration	7
3.1	LNA Configuration Data	7
3.2	Location Data Configuration	8
3.3	DNM Group-centric Data Example	9
3.4	Memory Constraint	14
4	Performance Management	15
5	Fault Management	17





1 Introduction

This document describes how to configure the Location-based Number Analysis (LNA) service in the MTAS.

1.1 Prerequisites

It is assumed that the user of this document is familiar with the O&M area, in general.

1.1.1 Licenses

To enable basic services in the MTAS, the Geo-Location Server license must be installed.

For more information about the Geo-Location Server license, refer to *MTAS Licenses*.

1.1.2 Documents

Before starting any procedure in this document, ensure that the following documents are available:

- *Ericsson Command-Line Interface User Guide*
- *Managed Object Model (MOM)*

1.1.3 Conditions

The following condition must apply:

An Ericsson Command-Line Interface (ECLI) session in Exec mode is in progress.





2 Overview

The LNA service functions within the Redirect Server. The Redirect Server in the MTAS acts as a SIP redirect server within IMS networks. It processes INVITE requests and responds to the client with a new destination to be contacted, see Figure 1.

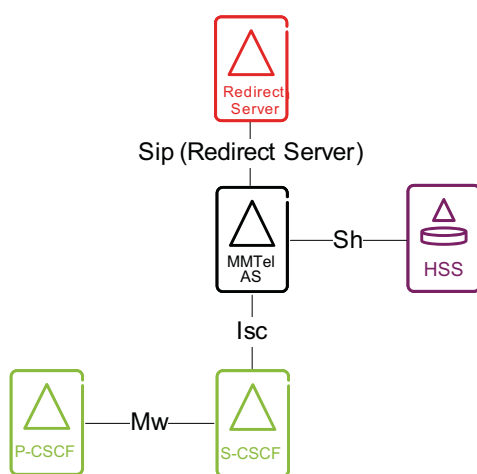


Figure 1 LNA Service Function

Based on the request and its database, the LNA service supplies the new destination that is sent back to the client. The LNA service is designed to support the users within North American Numbering Plan (NANP). The LNA service is focused on serving mobile subscribers.

The LNA service includes the seven-digit, short-code, ten-digit, and toll-free services. The seven-digit dialing service enables a subscriber to call local number by dialing only the local format part, which is seven digits length in NANP. When a served user dials seven-digit number, the LNA service checks whether the location from where the served user dials the number is within the home area. If the served user dials the seven-digit number from the home area, the LNA service completes the dialed number by adding the country code for North America. This code is followed by the subscriber's Numbering Plan Areas (NPA) prefix for obtaining a global e.164 number. However, if the served user dials the seven-digit number from outside the home area, the LNA service rejects the call attempt by playing a specific announcement.

The seven-digit dialing service also allows for certain areas to be restricted from dialing seven-digit calls. A seven-digit call attempt from a restricted area is rejected even if it is made within the home area. This is only available if the LNA service is configured with group-centric data.

The short-code dialing service enables a subscriber to call an assigned short number (short-code). When a served user dials a short-code number, the LNA service checks the location from where the served user dials the number. Then,



the service replaces the short-code number with the associated URI, dependent on the position of the caller. If properly configured, dialing short-code from a different location results in a different actual URI to ensure that the caller is connected to the called party that serves the area. The short-code consists of fewer than seven digits and it can start with any number, including the “#” and “*” characters. The actual URI can be either tel URI, embedded tel URI, or SIP URI. The mapping to the location-based short-code can take into account the calling user's language preference.

The ten-digit dialing service enables a subscriber to call a national number by dialing the Numbering Plan Area (NPA) and the local number. The LNA service, when enabled, determines if the call is a local call or long-distance call. The LNA service completes the dialed number by adding the country code for North America. If the call was determined as long distance, an announcement is played informing the user about this. If the call was determined as local the call proceeds without announcement.

The toll-free service enables a subscriber to call a number (for example: 1-800-xxxxxxx or 310-xxxx) free of charge. The LNA service, when enabled, adds a prefix in front of dialed number, which ensures further routing in the network. The added prefix is dependent on the location where the subscriber attempts the call.

2.1 Subfunctions

This section describes the following subfunctions:

- Evaluated dialed number
- Managing dialed number mapping
- Processing seven-digit number
- Processing short-code
- Processing ten-digit number
- Processing toll-free number

2.1.1 Evaluated Dialed Number

The Evaluated dialed number subfunction evaluates the dialed number and determines whether the dialed number has seven-digit format, short-code format, invalid format, or other-but-valid format.



2.1.2 Managing Dialed Number Mapping

The Managing dialed number mapping subfunction includes configuration management, performance management, and fault management needed for the LNA service.

2.1.3 Processing Seven-digit Number

The Processing seven-digit number subfunction processes call attempt after the dialed number evaluation process determines that the dialed number has seven-digit format. This subfunction performs data lookup and then inserts +1NPA prefix into the dialed number.

2.1.4 Processing Short-code

The Processing short-code subfunction processes call attempt after the dialed number evaluation process determines that the dialed number has short-code format. This subfunction performs data lookup and then replaces the dialed number into an actual URI.

2.1.5 Processing Ten-digit Number

This is a subfunction of LNA function that processes call attempt after the dialed number evaluation process determines that the dialed number has ten-digit format. This subfunction performs data lookup and then inserts the +1 prefix into the dialed number.

2.1.6 Processing Toll-free Number

This is a subfunction of LNA function that processes call attempt after the dialed number evaluation process determines if the dialed number has toll-free number format. This subfunction performs data lookup and then inserts location-dependent prefix into the dialed number.

2.2 Interaction with Other Services

There is no interaction to other services.



3 LNA Configuration

The configuration of the LNA service can be broken down into the following steps:

1. Setting the MOs which control the LNA function
2. Setting the MOs which define the location data

Note: Redirect server is not supported in MTAS.

3.1 LNA Configuration Data

The MOs controlling the LNA service and an overview of the LNA MO structure are shown in Figure 2.

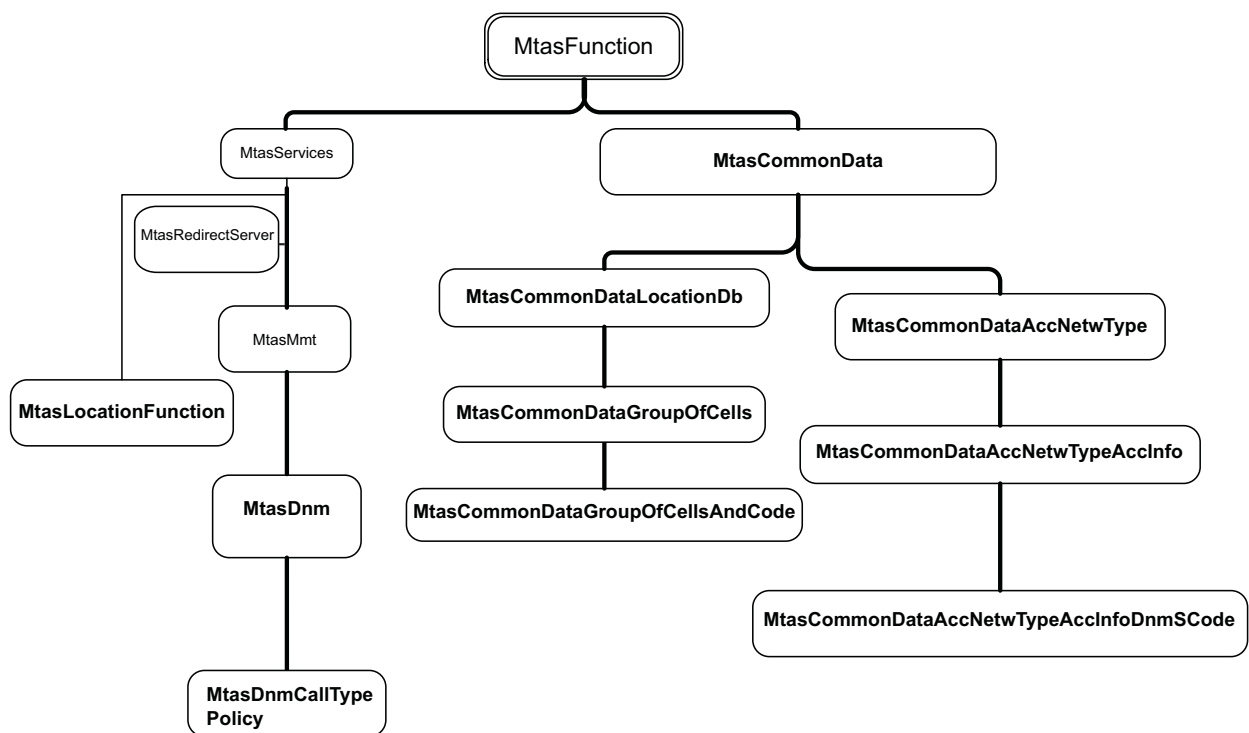


Figure 2 LNA MO Structure

For information on configurable MOs and attributes related to the LNA services, refer to *Managed Object Model (MOM)*.



3.1.1 LNA Administrative State Configuration

The LNA service is enabled by setting the `mtasRedirectServerAdministrativeState` attribute in the `MtasRedirectServer` MO to **1 (Unlocked)**. If the `mtasRedirectServerAdministrativeState` is set to **0 (Locked)**, no LNA service is provided by the MTAS.

3.1.2 Redirect Server Listening Port Configuration

The Redirect Server listening port is defined by setting the `mtasSipRsPort` attribute in the `MtasSip` MO. The value of this attribute has to be the same as the port defined in the `mtasLocationFunctionAddress` attribute.

For more information on configuring the `mtasLocationFunctionAddress` attribute, refer to *MTAS Dialed Number Mapping Management Guide*.

3.1.3 Additional Configuration Activities

The rest of the configuration activities which belong to the configuration of the LNA function are listed in Table 1.

Table 1 Additional Configuration Activities

Activity	Attribute
Set the attribute to 0 if there is no need to define areas where local (seven-digit) dialing is forbidden. Set the attribute to 1 if a list of restricted areas needs to be defined from where local (seven-digit) dialing is forbidden.	<code>mtasCommonDataNpaLocalFormatRestriction</code>
Define the list of NPA areas where local (seven-digit) dialing is forbidden.	<code>mtasCommonDataNpaAllowedLocalFormat</code>

3.2 Location Data Configuration

The location data is an MTAS representation of the location information (mobile cell based) and routing information which must be defined to enable the LNA function. One representation organizes data and groups mobile cells into bigger areas and stores the routing information per each area. This is the so called group-centric data model. See Section 3.3 DNM Group-centric Data Example on page 9 for example of data model.

The location data is stored on the node where the LNA service is installed (that is, the Redirect Server). The Redirect Server and the MMTel AS can be on the same physical node or separate node. For more details, refer to *MTAS Dialed Number Mapping Management Guide*.



3.2.1 Group-centric DNM Location Data Configuration

The configuration activities are listed in Table 2.

Table 2 Additional Configuration Activities

Activity	Attribute
Define the name of the groups of cells (mobile cells identified by the <code>mtasCommonDataAccNetwTypeAccInfo</code> attribute).	<code>mtasCommonDataGroupOfCells</code>
Define the sequence of digits which are inserted or appended into/to the dialed number in case the dialing attempt was determined to belong to this group and the call case is toll-free dialing.	<code>mtasCommonDataGroupOfCellsDigits</code>
Define the list of Numbering Plan Areas (NPA) connected to this group.	<code>mtasCommonDataGroupOfCellsNpa</code>
Define the connection between an existing group and a service code which needs to be mapped in this group.	<code>mtasCommonDataGroupOfCellsAndCode</code>
Define the list of mappings between a Uniform Resource Identifiers and language preferences which are applicable for this group and this short code.	<code>mtasCommonDataGroupOfCellsAndCodeMap</code>
Define the division layer and the group that the cells (identified by the <code>mtasCommonDataAccNetwTypeAccInfo</code> attribute) belong to.	<code>mtasCommonAccNetwTypeAccInfoMap</code>
Define the mobile cells present in the network.	<code>mtasCommonDataAccNetwTypeAccInfo</code>
Define the access network types which exist in the network.	<code>mtasCommonDataAccNetwType</code>

3.3 DNM Group-centric Data Example

This subsection provides examples of data to support the data lookup for LNA service.



3.3.1 MtasCommonDataAccNetwType

This section provides examples of data for the `MtasCommonDataAccNetwType` MO.

3.3.1.1 mtasCommonDataAccNetwType Attribute (Primary Key)

This attribute can only contain one of the following values:

- 3GPP-GERAN
- 3GPP-UTRAN-FDD
- 3GPP-UTRAN-TDD
- 3GPP-E-UTRAN-FDD
- 3GPP-E-UTRAN-TDD
- 3GPP2-1X
- 3GPP2-1X-Femto
- 3GPP2-1X-HRPD

3.3.2 MtasCommonDataAccNetwTypeAccInfo

This section provides examples of data for the `MtasCommonDataAccNetwTypeAccInfo` MO.

3.3.2.1 mtasCommonDataAccNetwTypeAccInfo Attribute (Primary Key)

The value of this attribute is a concatenation of the primary key of the parent class, which is the access type name, the `&` character, and the access-info string (in hexadecimal). Examples of this are as follows:

- Access type: 3GPP2-1X-Femto
Access-info string: 123456789A171A987654321
The `MtasCommonDataAccNetwTypeAccInfo` attribute value:
3GPP2-1X-Femto&123456789A171A987654321

This represents a mobile cell which is part of `scgrp1` group for short-code dialing, `WLCA3` group for ten-digit dialing, `Toronto5` for seven-digit dialing and `tollfree4` group for toll-free dialing.

- Access type: 3GPP-UTRAN-TDD
Access-info string: 234151D0FCE11
The `MtasCommonDataAccNetwTypeAccInfo` attribute value:
3GPP-UTRAN-TDD&234151D0FCE11



This represents a mobile cell which is part of scgrp1 group for short-code dialing, WLCA3 and lca5 groups for ten-digit dialing, and tollfree4 group for toll-free dialing.

- Access type: 3GPP-UTRAN-FDD
Access-info string: 234151D089E11
The `MtasCommonDataAccNetwTypeAccInfo` attribute value:
3GPP-UTRAN-FDD&234151D089E11

This represents a mobile cell which is part of 8lca, WLCA3, and lca5 groups for ten-digit dialing, and Toronto5 and grp10 groups for seven-digit dialing.

3.3.2.2

mtasCommonDataAccNetwTypeAccInfoMap Attribute

The value of this attribute is a concatenation of the division type string, the & character, and the group name string. Examples are the following:

- Division type: RO-SC (a number translation result)
Group name string: scgrp1
The `mtasCommonDataAccNetwTypeAccInfoMap` attribute value:
RO-SC&scgrp1
- Division type: RO-10 (a number translation result)
Group name string: WLCA3
The `mtasCommonDataAccNetwTypeAccInfoMap` attribute value:
RO-10&WLCA3
- Division type: RO-7 (a number translation result)
Group name string: Toronto5
The `mtasCommonDataAccNetwTypeAccInfoMap` attribute value:
RO-7&Toronto5
- Division type: PRE (a number translation result)
Group name string: tollfree4
The `mtasCommonDataAccNetwTypeAccInfoMap` attribute value:
PRE&tollfree4
- Division type: RO-10 (a number translation result)
Group name string: lca5
The `mtasCommonDataAccNetwTypeAccInfoMap` attribute value:
RO-10&lca5
- Division type: RO-10 (a number translation result)
Group name string: 8lca
The `mtasCommonDataAccNetwTypeAccInfoMap` attribute value:
RO-10&8lca
- Division type: RO-7 (a number translation result)
Group name string: grp10
The `mtasCommonDataAccNetwTypeAccInfoMap` attribute value:
RO-7&grp10



3.3.3 MtasCommonDataGroupOfCells

This section provides examples of data for the `MtasCommonDataGroupOfCells` MO.

3.3.3.1 mtasCommonDataGroupOfCells Attribute (Primary Key)

The value of this attribute is a string representing the name of the group of cells. Examples are the following:

WLCA3	This group stores the NPA value for ten-digit dialing.
lca5	This group stores the NPA value for ten-digit dialing.
8lca	This group stores the NPA value for ten-digit dialing.
grp10	This group stores the NPA value for seven-digit dialing.
Toronto5	This group stores the NPA value for seven-digit dialing.
tollfree4	This group stores the prefix value for toll-free dialing.

3.3.3.2 mtasCommonDataGroupOfCellsNpa Attribute

The value of this attribute represents the NPA-N used for ten-digit dialing or the NPA used for seven-digit dialing for the given group. Examples are the following:

- 8712
- 77256
- 7221
- 655
- 722

3.3.3.3 mtasCommonDataGroupOfCellsDigits Attribute

The value of this attribute represents the prefix used for toll-free dialing for the given group. Example is the following:

- AA321789

3.3.4 MtasCommonDataGroupOfCellsAndCode

This section provides examples of data for the `MtasCommonDataGroupOfCellsAndCode` MO.



3.3.4.1 mtasCommonDataGroupOfCellsAndCode Attribute (Primary Key)

The value of this attribute is a concatenation of group name, character &, and the dialed short-code. Example is the following:

- Group name: scgrp1
Access-info string: 123456789A171A987654321
(from mtasCommonDataAccNetwTypeAccInfoMap attribute)
Dialed short-code: #123
The MtasCommonDataGroupofCellsAndCode attribute value:
scgrp1{

3.3.4.2 mtasCommonDataGroupOfCellsAndCodeMap Attribute

The value of this attribute is a concatenation of language tag, the & character, and the actual URI, see Figure 3. Example is the following:

- Language tag: en-CA
Actual URI: tel:+17815623111
The mtasCommonDataGroupofCellsAndCodeMap attribute value:
en-CA&tel:+17815623111.

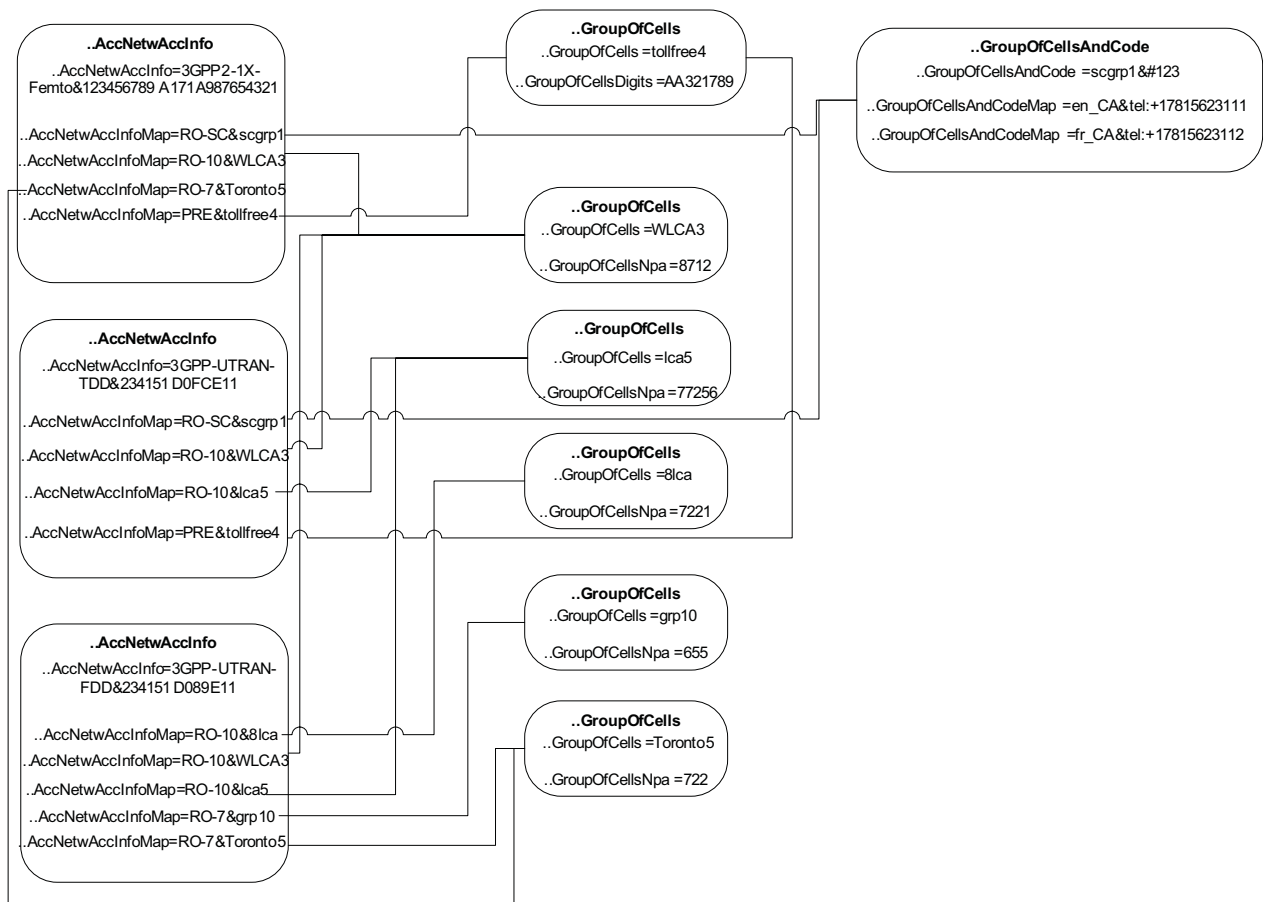


Figure 3 Data Example



3.4 Memory Constraint

When using NSP 6.1 with 3 subracks configuration and with 24 GB memory per card (28 Traffic Processors), the instances of `MtasCommonDataAccNetwTypeAccInfoDnmSCode` MOC must not exceed 360 million records. There is no restriction for the rest of the MOCs of the same data model.

The suggested maximum instances for the memory constraint are listed in Table 3.

Table 3 Memory Constraint

MOC Name	Suggested Maximum Instances
<code>MtasCommonDataAccNetwType</code>	8
<code>MtasCommonDataAccNetwTypeAccInfo</code>	800,000
<code>MtasCommonDataGroupOfCells</code>	10,000
<code>MtasCommonDataGroupOfCellsAndCode</code>	100,000,000



4 Performance Management

For measurements related to the LNA service, refer to *Managed Object Model (MOM)*.





5 Fault Management

For alarms related to the LNA service, refer to *MTAS Alarm List*.