

MTAS Number Translation Management Guide

MTAS

USER GUIDE

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1 Introduction

This document describes how to configure the MTAS Number Translation 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 the MTAS Number Translation service, the MMTel AS Voice Base license must be installed.

For more information about the MMTel AS Voice Base license, refer to [MTAS Licenses](#).

1.1.2 Documents

Before starting any of the procedures in this document, the following documents must be 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 Number Translation function translates dialed local or global numbers based on translation rules configured by the operator.

With the Number Translation service, a substitution rule-set using regular expressions can be applied to the number part of a tel URI or a number-based SIP URI (that is, embedded tel URI) received in the following:

- Request-URI of SIP INVITE
- Refer-To header of SIP REFER

Number Translation is active when its administrative state is unlocked on originating side and on terminating side in transit mode.

For more information about the URIs, refer to the following standards:

- [IETF RFC 3261, SIP: Session Initiation Protocol](#)
- [IETF RFC 3966: The tel URI for Telephone Numbers](#)

2.1 Subfunctions

The subfunctions included in the Number Translation service are described in this section.

2.1.1 Configure the Number Translation Rules

The translation rules are configured and activated by the operator, see Section 3 on page 7 and Section 4 on page 13 for more information.

2.1.2 Translate Number

The translation rules are applied to numbers dialed by the originating end user.

2.2 Interaction with Other Services

Number translation is executed after using the Abbreviated Dialing function and handling of Supplementary Service Codes but before Dial Number Mapping, Number Normalization, Short Number Dialing, and Hotline Service. Before selecting and applying the translation rules, the visual separators and the Carrier Select Codes are removed from the input number and user-equals-phone error correction is executed.



2.2.1 Abbreviated Dialing

For more information about the Abbreviated Dialing service of the MTAS, refer to [MTAS Abbreviated Dialing Management Guide](#).

2.2.2 Carrier Select and Carrier Pre-Select

For more information about the Carrier Select and Carrier Pre-Select services of the MTAS, refer to [MTAS Carrier Select and Carrier Pre-Select Management Guide](#).

2.2.3 Dialed Number Mapping

The Number Translation service can be used as part of the Dialed Number Mapping function to help location-dependent number analysis and replacement.

For more information about the Dialed Number Mapping service of the MTAS, refer to [MTAS Dialed Number Mapping Management Guide](#).

2.2.4 Hotline Service

For more information about the Hotline service of the MTAS, refer to [MTAS Hotline Service Management Guide](#).

2.2.5 Number Normalization

For more information about the Number Normalization service of the MTAS, refer to [MTAS Number Normalization Management Guide](#).

2.2.6 Short Number Dialing

For more information about the Short Number Dialing service of the MTAS, refer to [MTAS Short Number Dialing Management Guide](#).

2.2.7 STOD Call Pull

STOD Call Pull is not allowed for call sessions targeted at service numbers configured in the network of the operator, which includes National short codes.

National short codes must match a Number Translation rule that includes the “\$NSC” token, to be recognized by MMTel AS.

For more information about the STOD Call Pull service of the MTAS, refer to [MTAS Session Transfer to Own Device Management Guide](#).



2.2.8 Supplementary Service Codes

For more information about the Supplementary Service Codes service of the MTAS, refer to [MTAS Supplementary Service Codes Management Guide](#).





3 Number Translation Configuration

The Number Translation service rules are configured through the O&M interface and controlled by the `MtasNumberTranslation` MO. An overview of the Number Translation MO structure is shown in Figure 1.

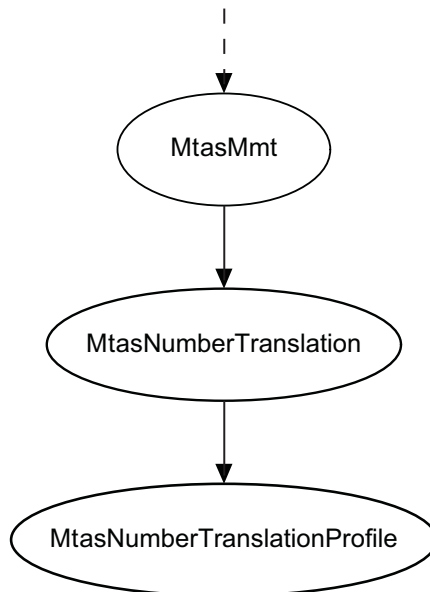


Figure 1 Number Translation MO Structure

Configurable MOs and attributes related to the Number Translation service are defined in Managed Object Model (MOM).

3.1 Number Translation Administrative State Configuration

The Number Translation service is enabled by setting the `mtasNumberTranslationAdministrativeState` attribute in the `MtasNumberTranslation` MO to 1 (Unlocked). If the `mtasNumberTranslationAdministrativeState` is set to 0 (Locked), no Number Translation service is provided by the MTAS.

3.2 Wholesale for Number Translation Configuration

The Number Translation service supports Wholesale. The Number Translation is configurable on Virtual Telephony Provider (VTP)-level.

Wholesale for the Number Translation is activated when the following attributes are set to 1 (Unlocked):

- The `vtasNumberTranslationAdministrativeState` attribute in the `VtasNumberTranslation` MO.



- The `mtasNumberTranslationAdministrativeState` attribute in the `MtasNumberTranslation` MO.

For more information about the Wholesale service, refer to [MTAS Wholesale Support Management Guide](#).

3.3 Configuration Activities

The configuration activities are listed in Table 1.

Table 1 Additional Configuration Activities

Activity	Attribute
Controls the mechanism used to load (and cache) the data.	<code>mtasNumberTranslationActivationState</code>

3.4 Number Translation Profile Configuration

The profile applicable to an input number is selected based on the key of the `MtasNumberTranslationProfile`. The substitution rules are stored in the different entries of the `mtasNumberTranslationRule`.

3.5 Translation Rules

The translation rules can be organized in up to a 1000 profiles including a default profile. The number prefix used as a profile name must be unique and shorter than 16 characters. The profile name can contain digits 0–9 and the characters “s”, “h”, and “p”. Alternatively, the profile name can have the value `DEFAULT` defining the default profile.

The characters “s”, “h”, and “p” are replacements for “*”, “#”, and “+”, which have a special meaning in LDAP Distinguished Names, and thus they cannot be used to configure a Number Translation profile over the MTAS OAM interface. The Number Translation function resolves the character replacements before building the Number Translation lookup tree. Replacement only applies to profile names; these characters must not be replaced in substitution rules.

A lookup tree for selecting the applicable translation rule based on the prefix of the input number is shown in Figure 2. MTAS builds a lookup tree to select the applicable profile efficiently. The lookup tree is built on startup and is rebuilt whenever new translation rules are activated, see Section 3.6 Activation Mechanism on page 11 for details on the activation mechanism.

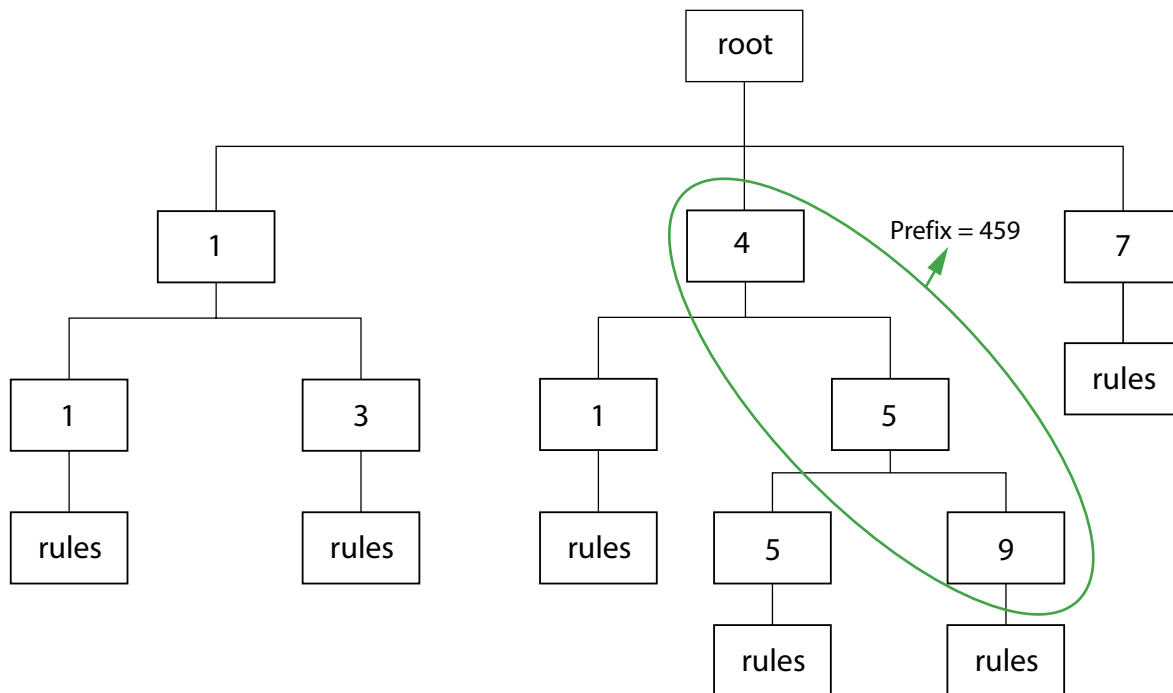


Figure 2 Lookup Tree for Selecting the Applicable Translation Profile

To find and execute the applicable translation rule, do the following:

1. The profile with the longest matching prefix is selected using the lookup tree. The lookup is performed in several steps equal with the length of the longest matching prefix. If no profile matching the prefix of the input number is found, the default profile is used. If there is no default profile, the input number is returned.
2. If there are no matching rules in the selected profile, the input number is returned. Otherwise, the first matching rule is executed. If the rule is terminal, the result is returned. Otherwise, the next matching rule is executed until there are no more rules in the profile.

Location-dependent rules are introduced by the location-based Number Analysis function. A rule is location-dependent when it contains the string "\$LOC", "\$PCM", or the "&" character. Number Translation can be applied to search for all rules, only location dependent or only location-independent rules.

3. For B-Number classification, if multiple rules match the number, then the first B-Number-Type field value is selected from the matching rules.

Before executing the translation rules, the visual separators are removed from the input number.

The configured translation rules have the following format (similar to the Number Normalization rules):

**Order:Substitution-rule:Terminal-match:Description:B-Number-Type**

The different parts of the translation rule have the following explanation:

— **Order**

An unsigned integer that defines which rule that is being matched first. The lowest number has the highest priority.

— **Substitution-rule**

A POSIX 1003.2 extended regular substitution rule of format `/regexp/replacement/`. Characters “*”, “#” and “+” are allowed in this field and no replacement are to be used for them.

Note: Characters “*” and “+” are to be escaped in regular expressions.

— **Terminal-match**

The value is either “TRUE” or “FALSE” indicating if the expression is terminal or not. If there is a terminal expression, the substitution result is returned, otherwise, further substitutions are performed.

— **Description**

Description can be used for some explanatory text for the rule. The characters “/” and “:” are not allowed in this field. An empty string is allowed. This field is mandatory if B-Number-Type field is present. If B-Number-Type field is not present, this field is optional.

— **B-Number-Type**

B-Number-Type is an optional field which can be used for B-Number classification. The B-Number is classified as follows:

- Toll-free if the value is BNumType=Tollfree
- National Short Code if the value is BNumType=NSC
- GP1 to GP10 if the value is BNumType=GP1 to BNumType=GP10

All other values are discarded. The characters “/” and “:” are not allowed in this field.

For configuration examples, see Section 4 on page 13.

The substitution rules configured for the Number Translation service must not conflict with the Number Normalization rules and are set up by considering the configured OSN/NSN numbers, Carrier Select special numbers, test numbers, Global White/Black List, and also Barring Categories where there is partial match for leftmost digits.



3.6 Activation Mechanism

The `mtasNumberTranslationActivationState` attribute controls the mechanism used to load and cache the translation rules. By default, it is set to 0 (IDLE). Updating the cached data is started when it is set by the operator to 1 (ACTIVATE). When the data is fully loaded, the activation state is set back to 0 (IDLE) automatically.

For Whole Sale, the `vtasNumberTranslationActivationState` attribute controls the mechanism used to load and cache the translation rules. By default, it is set to 0 (IDLE). Updating the cached data is started when it is set by the operator to 1 (ACTIVATE). When the data is fully loaded, the activation state is set back to 0 (IDLE) automatically.

Loading and caching the translation rules can also be performed using the administrative operation `mtasNumberTranslationActivate` and `vtasNumberTranslationActivate` for VTP.

This action controls the mechanism used to load and cache the translation rules. Updating the cached data is started when this administrative operation is begun. Changing any configuration data related to number translation while the translation rules are loading is refused. The status of the asynchronous operation - that is either 0 (ACTIVATE) or 2 (PROCESSING) - is reflected in the corresponding `mtasNumberTranslationActivationState` or `vtasNumberTranslationActivationState` attribute.





4 Configuration Examples

This section presents configuration examples for the Number Translation function.

The Number Translation configuration with rule-set 1 is shown in Example 1.

```
MtasNumberTranslationProfile:
MtasNumberTranslationRule: 10:/^123$/7654321/:TRUE
mtasNumberTranslationRule: 20:/^456$/4321765/:TRUE
```

Example 1 Rule-set 1

The rule-set 1 configuration in Example 1 has the following input and output URIs:

— Input URI

tel:456

— Output URI

tel:4321765

The Number Translation configuration with rule-set 2 is shown in Example 2.

```
MtasNumberTranslationProfile: "45"
mtasNumberTranslationRule: "10:/^455//:TRUE"
mtasNumberTranslationRule: "20:/789$//:TRUE"

MtasNumberTranslationProfile: "459"
mtasNumberTranslationRule: "10:/^459//:FALSE"
mtasNumberTranslationRule: "20:/789$//:FALSE"
mtasNumberTranslationRule: "30:/^4556$/2847/:TRUE"

MtasNumberTranslationProfile: "s22"
mtasNumberTranslationRule: "10:/^\\*22$/770261143/:TRUE: \\
Wholesale customer"

MtasNumberTranslationProfile: "DEFAULT"
mtasNumberTranslationRule: "10:/1234/5555/:TRUE"
```

Example 2 Rule-set 2

Note: The “*” character in translation profile s22 must be escaped in the regular expression.

The rule-set 2 configuration in Example 2 has input and output URIs as in Table 2:

Table 2 Examples of Number Translation Results

Input Number	Selected Profile	Output Number
4554554	Profile = 45	4554



Input Number	Selected Profile	Output Number
4511789	Profile = 45	4511
4594556789	Profile = 459	2847
*22	Profile = s22	7702611403
7123490	Profile = DEFAULT	7555590

The Number Translation configuration with rule-set 3 is shown in Example 3.

```
MtasNumberTranslationProfile="310"
```

```
mtasNumberTranslationRule="1:/(^310[0-9]{4})/$LOC\1&PRE/TRUE"
```

```
MtasNumberTranslationProfile: "DEFAULT"
```

```
mtasNumberTranslationRule:"10:/^1234/\1|$PCM/:TRUE::BNumType=Tollfree"
```

Example 3 Rule-set 3

The rule-set 3 configuration in Example 3 has input and output URIs as described in Table 3.

Table 3 Examples of Number Translation Results

Input Number	Selected Profile	Output URI
tel:3109876 ;phone-context=+1781	Profile = 310	sip: \$LOC3109876&PRE ;phone-context=+1781
tel:1234567 ;phone-context=+1781	Profile = DEFAULT	sip: 1234567 \$PCM ;phone-context=+1781

For the first URI, the Number Translation Service matched a toll-free number starting with the digits 310; inserts "\$LOC" before the dialed digits and "&PRE" after the dialed digits. The "\$LOC" string is replaced by the Dialed Number Mapping service to a location-specific string. The "PRE" string serves as an input also to the Dialed Number Mapping service. The last part classifies the B-Number as toll-free.

For second URI, the Number Translation service matched a number starting with the digits 1234; inserts "|\$PCM" after the dialed digits. The "\$PCM" string is indicator for the Dialed Number Mapping service to modify the phone-context of the dialed number. The last part classifies the B-Number as toll-free.

For more information about the Dialed Number Mapping service of the MTAS, refer to [MTAS Dialed Number Mapping Management Guide](#).



5 Performance Management

Measurements related to the Number Translation service are detailed in MTAS Performance Measurements.





6 Fault Management

Alarms related to the Number Translation service are listed in MTAS Alarm List.