

CONFIDENTIAL

MetaSwitch Class 4/5 Softswitch Operations Manual: Routing

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Issue Status

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1. Getting Started

This manual applies to MetaSwitch VP3500, VP3510 and VP2510 Integrated Softswitches and CA9000 Series Call Agents.

- References to the MetaSwitch Class 4/5 Softswitch or to the NE (Network Element) apply to all of these systems, except where there is a specific reference to one or more of the above product numbers.
- References to the MetaSwitch Call Agent or to the Call Agent apply both to CA9000 Series Call Agents and to the call agent function within the VP3500, VP3510 and VP2510 Integrated Softswitches, except where there is a specific reference to the VP3500, VP3510, VP2510 or CA9000 Series.

This manual is intended for use in conjunction with the separate manual *Operations Manual: Overview*, which provides introductory information about the MetaSwitch Element Management System (EMS). If you are not familiar with managing the MetaSwitch Class 4/5 Softswitch, or if you are setting up and configuring a new installation, you should start with *Operations Manual: Overview* for a general overview. This manual contains information specific to configuring the MetaSwitch Class 4/5 Softswitch call routing features and verifying the routing configuration.

1.1 About This Manual

This manual describes how to configure the MetaSwitch Class 4/5 Softswitch call routing features and verify the routing configuration.

Chapter 2, **Introduction to Routing**, explains the digit maps, number validation tables and routing tables that the MetaSwitch Class 4/5 Softswitch uses, and describes how you may need to modify them.

Chapter 3, **Routing**, explains how to configure and manage routing for the MetaSwitch Class 4/5 Softswitch.

Chapter 4, **Call Verification**, explains how to configure and use the Route Verification Tests and Test Calls provided by the MetaSwitch Class 4/5 Softswitch.

Appendix A, **Attribute Properties**, provides details of the routing attributes that the MetaSwitch Class 4/5 Softswitch supports and of how it uses them.

1.2 Related Manuals

MetaSwitch Class 4/5 Softswitch What's New introduces the new functions and features that have been introduced in this release of the MetaSwitch Class 4/5 Softswitch, and indicates where to find more information about them in the other manuals.

MetaSwitch Class 4/5 Softswitch System Overview provides a technical description of the MetaSwitch Class 4/5 Softswitch.

MetaSwitch Class 4/5 Softswitch System Planning Guide describes how to determine the correct MetaSwitch Class 4/5 Softswitch configuration, and other system considerations, to suit your deployment scenario and capacity requirements.

MetaSwitch Class 4/5 Softswitch IP Network Design Guide provides additional system planning information that you will need in order to determine your IP networking requirements.

MetaSwitch VP3500 / MG3500 Network Element Installation and Maintenance Guide provides a complete description of the MetaSwitch VP3500 and MG3500 chassis hardware, and explains how to install, replace and maintain it.

MetaSwitch VP3510 / MG3510 Network Element Installation and Maintenance Guide provides a complete description of the MetaSwitch VP3510 and MG3510 chassis hardware, and explains how to install, replace and maintain it.

MetaSwitch VP2510 / MG2510 Network Element Installation and Maintenance Guide provides a complete description of the MetaSwitch VP2510 and MG2510 chassis hardware, and explains how to install, replace and maintain it.

MetaSwitch CA9000 Series Network Element Installation and Maintenance Guide provides a complete description of the MetaSwitch CA9000 Series hardware, and explains how to install, replace and maintain it.

MetaSwitch IS, CA and MG Craft Interface Guide describes the CRAFT interface that is used in MetaSwitch Integrated Softswitches, Call Agents and Media Gateways.

MetaSwitch Class 4/5 Softswitch Ancillary Servers Guide describes a number of additional server computers that operate with the MetaSwitch Class 4/5 Softswitch, and explains how to install, replace and maintain them.

MetaSwitch Class 4/5 Softswitch Servers Hardware Guide provides details of the hardware used in the EM4000 Series, EM3300A, WS4000 Series, and WS3300A high performance servers. These servers are used to run the ancillary servers.

MetaSwitch Class 4/5 Softswitch Operations Manual contains information for central network operators who configure and manage the MetaSwitch Class 4/5 Softswitch. This manual is in a number of sections:

- *Operations Manual: Overview* provides an introduction to the EMS and explains how to manage common features such as user access and diagnostics information.
- *Operations Manual: System Hardware and Line Cards* explains how to manage the MetaSwitch Class 4/5 Softswitch's system hardware components, its line cards and their ports.
- *Operations Manual: SS7 and MF Connectivity* explains how to manage the MetaSwitch Class 4/5 Softswitch's connectivity within SS7 and MF signaling networks.
- *Operations Manual: Other Protocols Connectivity* explains how to manage the MetaSwitch Class 4/5 Softswitch's Call Agent, Domain Name Services, user access devices, ISDN and SIP connectivity.
- *Operations Manual: Routing* (this manual) explains how to manage the MetaSwitch Class 4/5 Softswitch's routing tables and how to verify the routing configuration.
- *Operations Manual: Billing* explains how to manage the MetaSwitch Class 4/5 Softswitch's billing features.
- *Operations Manual: Call Services and Subscribers* explains how to manage the MetaSwitch Class 4/5 Softswitch's subscribers and the services available to them.

MetaSwitch Class 4/5 Softswitch Tasks Guide describes how to use the tasks feature in the EMS to perform common procedures relating to subscribers and their access hardware.

MetaSwitch Class 4/5 Softswitch Emergency Standalone Guide provides background and planning information for the MetaSwitch Emergency Standalone (ESA) function, and describes how to configure and manage it.

MetaSwitch Class 4/5 Softswitch Operational Procedures Manual provides procedures for common operations required to provision and maintain a MetaSwitch Class 4/5 Softswitch installation.

MetaSwitch Class 4/5 Softswitch Call Services Manual lists the Call Services supported by the MetaSwitch Class 4/5 Softswitch, provides information about their configuration and billing, and describes how the subscriber uses them.

MetaSwitch UC9000 CommPortal and Web Self-Care Guide provides details of how to set up and configure the Web Server and the UC9000 CommPortal and Web Self-Care UIs, and how to customize these UIs to meet your needs. Your subscribers can use these web UIs to manage their telephone service.

MetaSwitch UC9000 CommPortal Client Interface Guide explains the underlying CommPortal client interface, used by the UC9000 CommPortal web UI to access subscriber data. This information will be useful to developers of more advanced CommPortal customizations, or developers creating their own CommPortal web UI from scratch.

MetaSwitch Class 4/5 Softswitch Integration and Customization Manual contains information for operational support personnel who need to integrate the MetaSwitch Class 4/5 Softswitch into their network management and billing systems.

MetaSwitch Class 4/5 Softswitch Glossary explains terms and abbreviations used in the MetaSwitch Class 4/5 Softswitch manuals.

1.3 Conventions

The MetaSwitch documents use the following conventions.

Usage	Convention
Reference to another document	<i>Operations Manual: Overview</i>
Reference to a section within a document	Overview
Filename	<code>.login</code>
Commands that you type at an operating system prompt	<code>cd /</code> <code>vi .login</code>
Placeholder in a command, which you need to replace with a specific value	<code>vi <i>filename</i></code>
Computer output	Command completed successfully.



Danger

This symbol identifies areas where failure to follow the correct procedure may cause injury to yourself or to other people.



Warning

This symbol identifies areas where failure to follow the correct procedure may prevent the equipment from operating correctly.



Information

This symbol identifies additional information that may help you to use the equipment or to perform a task.

2. Introduction to Routing

This chapter provides an introduction to the Digit Maps, Number Validation tables, and Routing tables used by the MetaSwitch NE. This is the most complex aspect of configuring the operation of the MetaSwitch NE, so early sections of this chapter concentrate on explaining how the MetaSwitch NE processes routing requests and introducing the concepts you need to understand. Details of specific objects are described in chapter 3.

The configuration delivered with the MetaSwitch NE includes a standard set of Digit Maps, Number Validation tables, and Routing tables. These should provide a good base in most systems, and we expect that you should need to modify only small sections of the delivered configuration. The system is very flexible and allows you to make significant modifications to this configuration but we recommend that you exercise caution in doing so. If necessary, MetaSwitch support personnel should be able to help you to understand the delivered configuration and to make any modifications that you need for your deployment.

This chapter suggests areas that you may need to customize and provides guidance on how to do so.

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2.1 Overview of Processing

The Routing configuration is a core part of the MetaSwitch NE, because it ties together trunks, subscribers and call services.

- This is the area that decides the type of call being made (intraLATA, toll-free, emergency, . . .) so that the call services can handle it appropriately.
- It is also the area that decides which trunk to use for an outgoing or tandem call.

This means that the Routing configuration is relatively complex. However, the NE comes with an extensive pre-installed configuration so that you do not have to create all of the configuration from scratch. You just have to understand the pre-installed configuration (also known as the base configuration), so that you can make the required small configuration changes for your particular setup.

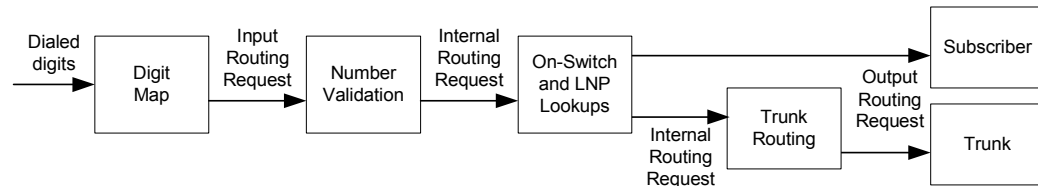
The rest of this chapter gives an overview of how the routing configuration handles a call, and introduces the important concepts in this area.

The process of routing a call from a subscriber on the switch can be divided into four distinct stages, which are summarized as follows.

- **Digit Maps** collect and validate the dialed digits, ensuring that a complete valid digit string has been collected (and rejecting any incorrect dialing attempts) before passing control to later stages of routing.
- **Number Validation** interprets the dialed digits to determine the type of call being made, and to set up attributes (described in section 2.1.2) that determine how the call should be routed. If required, it also normalizes the number into a standard format: for example, it may convert a 7-digit number to the standard 10-digit format, or strip a prefix such as a carrier code (storing the information provided by this prefix in the call attributes).
- **On-Switch and LNP Lookups** determines whether the called number identifies a subscriber on the switch, or is one for which the switch must perform a Local Number Portability (LNP) lookup. If required, an Intelligent Networking Services lookup may take place at this stage; depending on the configuration, processing may return to Number Validation after this lookup to set new attribute values.
- **Trunk Routing**, which is invoked only if On-Switch and LNP Lookups determines that the called number is not a subscriber on the switch, determines the appropriate trunk to be used in routing the call.

Figure 1 illustrates the path of a routing request through these stages.

Figure 1. Path of routing request within MetaSwitch NE



The stages above apply to calls from subscribers on the switch, which require the most complex processing. For incoming calls received over the network:

- The Digit Maps stage does not apply, and Number Validation is normally much simpler. This is because the dialed digits have already been collected and normalized by the originating switch.
- If you have problems with incoming calls from long-distance carriers that attempt to avoid paying for terminating calls at this switch, you can filter out calls from these carriers during number validation. For more details, see the Knowledge Base on the MetaSwitch Customer Portal (<http://support.metaswitch.com>).
- On-Switch and LNP Lookups and Trunk Routing operate in the same way as for calls from subscribers on the switch.

2.1.1 Routing in the EMS

In the EMS, all of the Routing configuration is contained in child objects of the Call Agent object, so that it can be stored centrally and does not need to be duplicated on multiple Media Gateways. The Call Agent passes the configuration information to its associated Media Gateways as required; for example, it passes digit map information to the Media Gateways so that they can interpret the dialed digits for a call originating on the switch. This means that you configure Routing on a VP3500, VP3510 and VP2510 Integrated Softswitch or on a CA9000 Series Call Agent, but not on an MG3500, MG3510 or MG2510 Media Gateway.

The set of EMS objects containing all the information necessary for Routing are all child objects of a single **Config Set** object. You can configure two or more Config Sets containing different versions of the routing configuration, but only one of these can be in use by the switch at any time. This means that you can create a temporary copy of the configuration in which you can make changes (leaving the in-use Config Set unchanged), and switch from one to the other after you have completed and checked your changes.

To follow the path of a call through Number Validation and Routing, first look at the in-use Config Set to determine the initial Attribute Set and Number Validation Table to be used for the call. (These depend on the called address type, which is “dialed digits” for calls originating on the switch and “E.164” for incoming calls.) From here, follow through the Number Validation Table to determine the best-match Number Validation Entry for the call (based on the initial attributes). The Number Validation Entry then specifies the next action to be taken, for example looking up the call in another table, and optionally an additional attribute set to be applied. Follow the sequence of Number Validation Tables and then Routing Tables to determine how the call is processed.

2.1.2 Overview of Attributes

The dialed number and the subscriber line (for a call from a subscriber on the MetaSwitch NE) have associated with them a number of properties such as whether the call is national or international, or whether operator assistance is required. These properties may affect how establishment of the call progresses. Details of these properties are appended to the message as “Attributes”. Attributes not only play an essential role in internal processes such as number validation, call routing and billing, but also define parameters that are included in the outgoing call establishment message.

Some attributes are intrinsic properties of the call (such as the signaling gateway on which the call arrived) or of the subscriber making it (such as the subscriber group in which this subscriber is configured). You can match on these attributes in a Number Validation Entry or Routing Action, but cannot modify them; see the descriptions of these objects in sections 3.1.17 and 3.1.23 for more information. Other attributes can be set and modified during number validation and routing (such as the structure code to be used in billing records for the call, or the maximum call duration); see the description of the Attribute Entry object in section 3.1.14 for a full list.

For more details of how attributes are set and used in Number Validation and Routing, see sections 2.3.4 and 2.5.

2.1.3 Notations used in representing strings of digits

Throughout this chapter, the following notations are used when describing strings of digits.

- X** Any numerical digit 0 – 9.
- ()** The digit within the parentheses is optional.
For example, **(0)XXXX** represents **0XXXX** and **XXXX**.
- []** One of the digits within the square brackets is used.
For example, **[01]XXX** represents **0XXX** and **1XXX**.
Sometimes a range of values can be represented within the square brackets. For example, **[013 - 5]XXX** represents **0XXX**, **1XXX**, **3XXX**, **4XXX** and **5XXX**.
- .** The period character is used to indicate an arbitrary number of instances of the preceding construct. For example, **2X.#** represents **2#** (zero repetitions of **X**), **23#** (one repetition of **X**) **276#** (two repetitions of **X**) etc.

This notation is valid in digit maps, but not in number validation entries.
- *** The * key on the telephone.
- #** The # key on the telephone. In digit maps, this digit is used to indicate that dialing is complete, and should only ever be used at the end of a string of dialed digits.
- T** Expiry of the inter-digit timer in digit maps.

2.2 Digit Maps

When a subscriber dials a number, rather than transmitting each dialed digit to the next stage of Routing processing separately as soon as it is dialed, it is more efficient to collect the dialed digits close to the source and transit them within a single message. Or, if a subscriber dials an FGD carrier dialing prefix before the telephone number, it is more efficient to accumulate the digits identifying the carrier and transmit them in one message (enabling the number validation and routing processing to begin), and then accumulate the digits composing the telephone number and transmit them in a second message.

Because telephone numbers and access codes can be variable lengths, there must be a mechanism to interpret the digits as they are dialed and to determine when the accumulated digits should be transmitted to the next stage of Routing. A **Digit Map** provides the intelligence to do this. It consists of multiple entries, each defining a digit sequence that can be dialed; the complete set of entries in the digit map defines the dial plan for the calling subscriber.

When each digit is received, the current string of dialed digits is compared to the digit sequences specified in the digit map, attempting to match an entry. The complete string of dialed digits is forwarded up the stack if either a **match** or a **mismatch** occurs.

- A **match** occurs when the current string of dialed digits perfectly matches an entry in the digit map.
- A **mismatch** occurs when
 - enough digits have arrived to ensure that the dialed digit sequence will not match any of the entries in the digit map
 - further digits are required to make a match and another digit is not entered before the interdigit timer expires.

If neither a match or a mismatch occurs, (i.e. the current string partially matches at least one entry in the digit map) the next dialed digit is added and the new current string is compared to the digit map. This cycle is repeated until either a match or a mismatch occurs.

2.2.1 Format of the digit map

The digit map takes the format of an ASCII string enclosed in parentheses, with each entry separated by a vertical line. The notation used in this string is described in section 2.1.3, **Notations used in representing strings of digits**.

The example below is a very simple digit map with only a small number of entries.

```
(0T|101T|101XXXX|[2-9]11|1[2-9]XXXXXXXXXX|011X.|[X*].#)
```

This example matches the following dialed digits sequences:

- A single digit **0**
- The digits **101**
- The digits **101** followed by any four digits
- One of the digits **2 - 9** followed by **11**
- **1** followed by one of the digits **2 - 9** followed by any nine digits
- ...

Interdigit Timer

When one valid digit sequence in the digit map prefixes another valid digit sequence, the **interdigit timer** is used to resolve any ambiguities. The timer can take two values, T(critical) and T(partial).

- If the dialed digit sequence so far results in a match in the digit map but could also be the prefix of another matching sequence (for example if the dialed string is **123** and both **123** and **12345** are valid matches), the shorter timer T(critical) is used to resolve the ambiguity without introducing excessive delays. If no further digits are dialed within this time, the shorter string is matched. This is specified explicitly in the digit map by the letter T.
- If the dialed digit sequence so far does not result in a match in the digit map but could be the prefix of another matching sequence (for example if the dialed string is **123** and **12345** is a valid match), the longer timer T(partial) is used to allow the subscriber more time to dial further digits. If no further digits are dialed within this time, the sequence is considered a mismatch. This timer always runs after a digit is dialed, unless a match has been found and the critical timer is running.

For example, **0** is dialed to connect to an operator, and also prefixes an international call; after **0** is dialed, a wait is necessary to determine whether any further digits will be dialed.

Both of these timer values can be configured in the Digit Map object; T(partial) must be longer than T(critical). These configured values apply only to Media Gateways controlled using Megaco, and not to third-party gateways controlled using MGCP. If you do not specify values, the Media Gateway's default values are used instead; for a MetaSwitch Media Gateway these are 16s for T(partial) and 4s for T(critical).

2.3 Number Validation

Number Validation consists of the following phases.

- Validating, normalizing and categorizing the called number. You can also normalize the calling party number and the charge number.
- ANI Screening and/or collection of an Authorization Code (if required).
- Performing carrier selection (this phase is required only for subscriber dialed calls, and not for incoming calls).
- **Validation** is checking that the called number is valid. For example, checking that the right number of digits are present, or that the country code is recognized for international calls.
- **Normalization** is reformatting the called number into a standard format that can be understood by other MetaSwitch Class 4/5 Softswitch components and by the network. For example, you may need to remove prefix digits dialed by the subscriber.

Number normalization can also be performed on the calling party number and charge number. This can be useful if, for example, you route calls to another company who require these numbers in a specific format. This can be the case with some Extended Area Service agreements where calls can be rejected if the calling party number is not in a specific format.

- **Categorization** is extracting information about the number (for example, whether this is an operator call, or whether a particular carrier access code has been dialed) and storing it for later use. This information may be used later by number validation itself, by call routing, or to set up the fields correctly on an outgoing call establishment message (an ISUP IAM for example).
- **ANI Screening** determines whether a caller is authorized to make long-distance calls using the MetaSwitch NE's carrier code, based on the caller's number. This is typically a Class 4 feature for long-distance service.
- **Authorization Codes** require a caller to enter a code using the telephone keypad before they can call the requested phone number. Again, this is typically a class 4 feature for long-distance service.
- **Carrier selection** is determining the carrier (if any) to carry this call, and performing any special processing required for this carrier. (This phase is performed only for subscriber dialed calls and not for incoming calls.)

When Number Validation is complete, the possible outcomes are as follows.

- If Number Validation has completed successfully, the routing request will contain a normalized destination number along with the appropriate attributes required to route and progress the call.
- If an error occurred, or if the call was rejected by ANI Screening, the routing request contains an appropriate error code and tone/announcement to play.

The following sections describe the phases of Number Validation, and how the Number Validation Tables and Attribute Sets are used.

2.3.1 Validation, normalization and categorization

Validation, normalization and categorization consists of processing **Number Validation Tables** and **Attribute Sets**. These are defined as part of a Config Set.

- A Number Validation Table contains multiple Number Validation Entries, each of which contain a (wildcard) number and a series of “match attribute” fields.
- Each Number Validation Entry may be associated with an Attribute Set, specifying the attributes to be added to the routing request for calls that match the Number Validation Entry.
- Each Attribute Set contains one or more Attribute Entries, each consisting of an attribute type (such as the type of call, priority indicator, whether an operator is required) and a value.

For more details of how these tables and attribute sets are used, see the later section 2.3.4, **Table and Attribute Set processing**.

When a routing request is first received, the called address type is used to determine an initial Attribute Set and an initial Number Validation Table. (The called address type is “dialed digits” for calls originating on the switch and “E.164” for incoming calls.) The initial attribute values (as specified in the initial Attribute Set) are appended to the routing request. The initial Number Validation Table is then processed, to perform the number validation, normalization and categorization functions.

The Number Validation Entry that is matched in the Number Validation Table can include additional attributes that will be associated with the call. It also specifies the next action to be taken, for example rejecting the call, completing Number Validation, or looking up the call in a further table. If no Number Validation Entry can be matched, number validation fails and the call is rejected.

If the attributes associated with the call (either in the initial Attribute Set or assigned by a Number Validation Entry match) include the requirement for ANI Screening and/or an Authorization Code, Number Validation completes at this point; it restarts after the number has been successfully screened and/or the caller has provided a valid code. See section 2.3.2, **ANI Screening and Authorization Codes**, for more details.

After processing the tables, number validation moves on to the carrier selection phase.

2.3.2 ANI Screening and Authorization Codes

During the first phase of Number Validation, the NE determines whether the attributes associated with the call include the requirement for **ANI Screening**. This applies only if callers can make long-distance calls using the MetaSwitch NE's carrier code. If so:

- The NE halts Number Validation and performs the ANI Screening lookup before restarting Number Validation. This lookup determines whether the caller identified by the ANI (the calling telephone number) is permitted to make such calls.
- If the call passes ANI Screening, the Config Set specifies another Number Validation Table with which to restart Number Validation. Number Validation then restarts in order to continue with the subsequent phases of routing.
- If the call fails ANI Screening (the subscriber is not permitted to make this call), Number Validation completes at this point; the routing request contains an appropriate error code and tone/announcement to play.

Similarly, during the first phase, the NE determines whether the attributes associated with the call include the requirement for an **authorization code**. This can be used to provide calling card services. If so:

- The NE halts Number Validation and prompts the caller to enter a valid authorization code.
- If the caller provides a valid code, the Config Set specifies another Number Validation Table with which to restart Number Validation. Number Validation then restarts in order to continue with the subsequent phases of routing.
- If the subscriber does not enter a valid code, Number Validation completes at this point; the routing request contains an appropriate error code and tone/announcement to play.

2.3.3 Carrier selection

Carrier selection is the final phase of Number Validation, and consists of selecting the carrier (if any) to be used for the call, and setting up any attributes relevant for that carrier. Note that this phase is performed only for calls originating on the switch and not for incoming calls.

The **FGD carrier requirement** attribute determines whether a carrier is required for a call, and if so the type of carrier that is to be used (intraLATA, long-distance, or international).

- If this attribute is set to **None required**, carrier selection is not performed.
- Otherwise, the value of this attribute determines how to select the appropriate carrier, which will be one of the following:
 - The carrier ID dialed by the subscriber, if any.
 - A value specified by the **FGD carrier ID** attribute within the same Attribute Set.
 - The intraLATA, long-distance or international carrier configured for the originating subscriber.

If a carrier is required, the carrier selection phase then sets up the **FGD carrier ID** and **Transit Network ID** attributes to contain the selected carrier, applies the initial attribute set for carrier IDs, and then processes the “Carrier Table”. Note that if the selected carrier matches the carrier specified as the on-switch carrier in the Routing Config Set, then the carrier is not required as the call is already in the selected carrier's network; the call is just routed on destination number within the network.

The initial attribute set for carrier IDs specifies a set of default attributes (common to all carriers) that are added to the routing request before the carrier table is processed. If any of these attributes are already associated with the routing request, these values overwrite the existing values. These values may themselves be overwritten when the carrier table is processed.

The Carrier Table matches the carrier ID for the call (the value of the **FGD carrier ID** attribute) with the equivalent attribute in the Number Validation Entries. Processing the table modifies the attributes associated with the routing request as appropriate for the chosen carrier.

Note that for calls to non-geographic numbers where the MetaSwitch NE is configured to perform an AIN lookup, the carrier selected here may subsequently be overridden by a carrier returned on that lookup.

2.3.4 Table and Attribute Set processing

The Number Validation Tables and Attribute Sets provide extremely powerful and flexible control over Number Validation. If these tables are configured incorrectly, calls made by subscribers will not be dealt with as expected, and call setup requests may be sent into the network with incorrect parameters.

To process a table, the Number Validation component searches in the current Number Validation Table for the Number Validation Entry whose number and “match attribute” fields best match the current routing request. (See the sub-section **Matching in Number Validation Tables** for more information on how the best match is determined.) Other fields on the best matching Number Validation Entry are then used to manipulate the routing request and to determine what happens next. If no matching Number Validation Entry can be found, the call is rejected.

To follow how these tables are used in your configuration:

- Look in the Config Set for a number of fields specifying initial Number Validation Tables. Each of these specifies the table that is first used when processing calls of a particular type.
- Associated with each of these initial tables is an initial Attribute Set to be applied to calls of that type. See the sub-section **Setting Attributes** for more details.
- In the appropriate Number Validation Table for the type of call you are interested in, check the **Search type**, **Address match type** and **Match Attribute** parameters to determine how entries in this table are matched.
- The Number Validation Entry child objects within each table then determine how processing continues for different calls, according to the best match found in the table for the appropriate number and attributes.

When you have identified the best match Number Validation Entry, the most important fields are as follows.

- **Number action - called number** is primarily used to “normalize” the dialed number. It specifies how to edit the destination number, for example adding a specified prefix or deleting a prefix of a specified number of digits.

The **Number action - calling party number** and **Number action - charge number** fields can also be used to normalize the calling party number and charge number in the same way.

- **Routing Attribute Set** is used to associate further attributes with the routing request. It references an Attribute Set containing a set of Attribute Entries (type and value) that should be either added to or updated in the routing request. This field will be used in both types of table. See the sub-section **Setting Attributes** for more details.

- **Next action** specifies how to proceed after performing the **Number action** and applying the **Routing Attribute Set**. The most common options are as follows.
 - Move to the next Number Validation table (specified in the **Next Number Validation Table** field) and continue. This allows complex processing by chaining together multiple Number Validation Tables.
 - Finish this use of the Number Validation tables and move to next stage of Number Validation.
 - Reject the call and play the appropriate announcement. This allows specific announcements to be set up, for example, notification of an area code change.
 - Mark the call as a call to a service access code and finish routing entirely. This option is used when the number has been determined to be a code for accessing a call service (for example, the code dialed by a subscriber to set up his or her call forwarding configuration).
 - Store the supplied carrier ID and restart number validation. This is used when a subscriber dials a specific carrier ID before the destination number, to strip off that carrier ID and store it as an attribute, then to restart Number Validation with the remaining destination number.

Only the second and third options are expected to be used in the Carrier Table.

Matching in Number Validation Tables

A Number Validation Table normally matches on the called number, or (less commonly) on the calling number. It may also match on up to three attributes specified as “match attributes”. For example, a particular Number Validation Table could match on the called number, and also use the attributes **Subscriber Group** and **Called address scope** as match attributes. (See the description of the **Number Validation Table** object in section 3.1.16 for details of which attributes can be used as match attributes.)

Each Number Validation Entry within that Number Validation Table contains a match string for the calling or called number (the **Number** parameter, a string of explicit and wildcard digits) and optionally values for the match attributes. To match an entry, the called or calling number (as appropriate) must match the **Number** parameter in the entry, and the values of the match attributes in the request must match the values of the match attributes in the entry.

Note that an entry is not matched if the attributes do not match, even if the number matches completely. If no matching Number Validation Entry can be found, the call is rejected.

Match attributes can be matched in the following ways.

- **Exact match** - the Number Validation Entry is matched if the value of the attribute in the routing request matches a specified value in the entry.
- **Match any if present** - the Number Validation Entry is matched if the attribute is present in the routing request, whatever value of the attribute is in the routing request, but does not match if the attribute is not present.
- **Only match if absent** - the Number Validation Entry is matched if the attribute is not present in the routing request, but does not match if the attribute is present.
- **Match even if not present** - the Number Validation Entry is matched whether or not the attribute is present in the routing request. This option can be used to simplify attribute matching in the following ways.
 - The Number Validation Table may include "exact match" Number Validation Entries for one or more specific values of an attribute, and a single "match even if not present" Number Validation Entry as a default option to catch all other cases.
 - If the Number Validation Table matches on two (or more) attributes, it can include "exact match" entries for specific values of both attributes, and also entries that match a specific value of one attribute but use "match even if not present" to ignore the value of the other attribute.

In situations where more than one entry matches the number and attributes of the setup request, the **Number** field of the entry determines which entry has priority according to the following rules.

- **Choose the longest explicit match**

If the **Search type** of the number validation table is **Prefix match** it is possible that more than one entry specifies an explicit number (that is one that contains no X characters or [] constructs) and matches the number in the setup request. In this situation, the entry with the longest number has priority.

For example, the dialed number begins 011, the number validation table matches on the prefix, and there are two matching entries with numbers 01 and 011. The entry with the number 011 takes priority because it is a longer number.

- **If there is no explicit match, choose the longest wildcard match**

If the table does not contain an explicit entry to match the number on the setup request, the longest wildcard entry that matches takes priority.

- **If there are multiple wildcard matches of the same length, choose the most explicit**

For example, the dialed number begins 0208366, the number validation table matches on the complete number, and there are two matching entries with numbers 0208XXXXXXXX and 0208366XXXX. In the first entry, the fifth digit is a wildcard, in the second entry the eighth digit is a wildcard, so the second entry takes priority.

If the same number is dialed and the number validation table matches on the complete number and has matching entries [01]208XXXXXXXX and 0XXXXXXXXXXXX, the second entry takes priority because in the first entry the first digit is a wildcard.

- **If the number match is the same on both entries, choose the more precise attribute match**

For example, two number validation entries have the same number match, but also include different match attributes (or different match types for the same attribute). An entry for which the attribute match type is **Exact** takes precedence over one for which the attribute match type is **Match any if present** (because this is a more precise match); similarly, **Match any if present** takes precedence over **Match even if not present**.

It is possible to configure two Number Validation Entries that match on exactly the same combinations of number and attributes. This is a configuration error; the MetaSwitch NE resolves this by using the Number Validation Entry with the lowest index value, but also generates a log message to report the problem.

Setting Attributes

Within Number Validation, the validation, normalization and categorization cycle may occur several times. During each cycle, attributes can be applied by specifying a new Attribute Set to be applied to the call; these attributes are then inputs to later cycles. Attributes are also inputs to the carrier selection step. Within call routing, attributes are used as inputs both for routing to on-switch subscribers and for trunk selection.

As illustrated in Figure 1, the routing request, with appended attributes, is passed through several MetaSwitch Class 4/5 Softswitch components. Note the following points.

- Different attributes are set up, modified and used by different components. For example, the **Area code dialed** attribute is set up by Number Validation, and used only by the billing component.
- As a result of this, some attributes are present on the routing request only at specific stages. For example, the **Area code dialed** attribute is never present on the Input Routing Request, only the Internal Routing Request and Output Routing Requests.
- Some attributes are mandatory, and must be set to specific values at certain stages of the process. For example, the **Called address complete** attribute must be set when the routing request is forwarded by Number Validation to Call Routing.

In order to configure the number validation component correctly, it is important to know which attributes are set up on Input Routing Requests, which need to be set up on Internal Routing Requests and Output Routing Requests, and how the different attributes are used. This information is provided in Appendix A as follows.

- Table 1, **Components that add or use each attribute**, summarizes the following information for each attribute.
 - Stages of the routing request at which the attribute is/may be present.
 - Components that add or update the attribute.
 - Components that use the attribute.
- Table 2, **Constraints on attributes output from Number Validation**, details the constraints imposed on values of attributes on the Internal Routing Request forwarded by Number Validation to Call Routing.

2.4 On-Switch and LNP Lookups

When the Number Validation process is complete, the next step is deciding how to route the call.

First, the call routing component determines whether the destination number represents a subscriber on this switch, and/or is a number that requires a Local Number Portability (LNP) lookup. This phase is responsible for the following tasks.

- Routing the call to the destination if the destination number is subscribed to this NE and on-switch routing is permitted (if there is no requirement to use an external carrier and the call is not operator dialed).
- Rejecting the call if the destination number is not subscribed to this NE, but the parameters on the call show either that the number should be on this exchange and has not been ported to another exchange or that the number has been ported to this exchange.
- Performing an LNP lookup if the parameters on the call show that it has not previously been performed and the Lookup Number Block (or an attribute set up in number validation) shows that it should be performed for this number.



In the following cases, trunk routing is used even for a subscriber on the switch:

- If the NE supports subscribers in multiple local areas, and the call is between two different areas, there may be a regulatory requirement to route the call using an external carrier (and in some cases to perform an LNP lookup before doing so) even though both subscribers are on the same NE. In this case, trunk routing in order to route the call to the appropriate carrier. The **Force on-switch lookup** attribute can be used to override this if appropriate, so that the call will be routed on the switch if possible.
 - Operator dialed calls will be routed to the operator even though the called subscriber is on the switch.
-

A MetaSwitch NE is capable of performing LNP lookups in several scenarios.

- On its own behalf in its role as a Class 5 exchange in an LNP area. This includes the case where it must perform a lookup for a call made by a subscriber configured on this switch to another subscriber in the same local area who is not configured on this switch, or to another subscriber configured on this switch when the call must be routed over an external carrier that requires LNP lookups to be performed.
- On behalf of a remote Class 5 exchange in the same local area, when that remote Class 5 exchange does not have the capability to perform LNP lookups itself.
- As the 'N-1' exchange in a long distance or intra-LATA call arriving at a local area. This includes the case where this NE is acting as a Class 4 tandem for a local area and is receiving calls from Class 4s owned by other carriers.

To perform this processing, this phase of Call Routing uses attributes contained within the routing request, the configured subscriber records, and the configured Lookup Number Block. The Lookup Number Block defines the prefixes of subscriber numbers which may be present on this NE, or for which the NE may be required to perform LNP lookups, as follows.

- Prefixes originally allocated to this NE.
- Prefixes of numbers that may have been ported to this NE as part of Local Number Portability (LNP).
- Prefixes of other numbers in the local area, which may not be present on this NE but for which this NE must perform an LNP lookup. This case is normally used when this NE is acting as a Class 4 tandem performing 'N-1' lookups for calls arriving for the local area.
- Prefixes of sparsely owned number ranges where some, but not necessarily all, of the numbers in the range exist on this switch. This case is normally used when homing non-geographic numbers on this NE, or when the NE provides Point Code Proxy functions for a connected legacy Class 5 switch. For more information about Point Code Proxy, see *Operations Manual: SS7 and MF Connectivity*.

If the attributes assigned during this phase specify an Intelligent Networking Services trigger for the call (for example to perform an LNP lookup), the lookup takes place at this stage. The configuration of the Intelligent Networking Services Trigger (described in *Operations Manual: Call Services and Subscribers*) controls whether processing returns to the Number Validation phase in order to set attributes again after the lookup.

There are four possible outcomes from this phase of Call Routing.

- On-switch lookup is successful and details of the subscriber line to which to route the call are passed back in the routing response. This occurs when the destination subscriber is found on this NE.
- On-switch lookup fails and details of the error are passed back in the routing response. This occurs when the attributes on the request show that the destination subscriber must be located on this exchange, but it could not be found. It also occurs if the called subscriber cannot support the incoming call (for example, an ISDN data call routed to a non-ISDN subscriber).
- The trunk selection phase is invoked using the default initial routing table. This occurs in the following situations.
 - The Lookup Number Block showed that the destination number could not be present on this exchange.
 - The Lookup Number Block showed that the destination number was not originally allocated to this exchange and was not found on this exchange. This includes the case of a number belonging to a defined sparsely populated number range where the specific number requested is not defined.

- The trunk selection phase is invoked using the initial routing table for LNP lookup. This occurs when the Lookup Number Block showed that the destination subscriber may have been present on this exchange but it was not found (or the attributes set up in number validation specify that an LNP lookup is required), and this exchange does not support LNP lookup so must route to another exchange capable of performing an LNP lookup.

2.5 Trunk Routing

The Trunk Routing phase applies only if the On-Switch and LNP Lookups phase did not determine that the destination is an on-switch subscriber. It selects a media channel for routing the call to a remote exchange.

When trunk routing is complete, the routing response will contain details of the trunk to which to route the call. Alternatively, the routing response may contain an appropriate error code if an error occurred.

Trunk routing operates by processing Routing Tables. The initial routing table to use is determined by the first phase of routing, as described in section 2.4, **On-Switch and LNP Lookups**.

Each Routing Table has a specified type which defines the method used to select a Routing Action within the table and (if relevant) the fields of the Routing Actions that are used for matching. The most common types of Routing Table are:

- **Destination address** – the destination address of the call is used to match with a Routing Action in the table.
- **Source address** – the source address of the call is used to match with a Routing Action in the table.
- **Transit address** – the selected carrier for the call is used to select a Routing Action in the table.
- **Exchange type** - the type of exchange that originated the call or from which the call was received (this switch, any other exchange, or a specified exchange) is used to select a Routing Action in the table.
- **Subscriber NV and routing attributes** - the subscriber routing attributes associated with the call are used to select a Routing Action in the table.
- **Number Validation Attributes** - the attributes set during Number Validation are used to select a Routing Action in the table.

A Routing Action includes a group of fields (starting with the field **Optional attributes to set**) specifying additional attributes to be set. If this Routing Action is selected, the specified attributes are added to the routing request, for use later in the routing process.

You can also perform number normalization during trunk routing if, for example, calls routed down a given trunk need the called party number, calling party number or charge number to be presented in a specific format. As with the number validation stage, this can be useful if, for example, you have an Extended Area Service agreement that requires this. To do this, use the **Number action** fields in the Routing Action.

The next step then depends on the value of the **Action** field in the Routing Action. There are four possibilities:

- The **Action** field indicates that routing is complete. In this case the Routing Action must also specify the media channel to be used to route the call. Note that a Routing Action will not be selected if it specifies a media channel that does not support the bearer type of the call; for example, a non-voice call will not be routed over a voice-only MF trunk, and a call that requires end-to-end SS7 capability will always be routed over an ISUP trunk.
- The **Action** field indicates that a further Routing Table should be processed. In this case, the Routing Action must also specify the next Routing Table.
- The **Action** field indicates that it is not possible to route the call and the routing request should be rejected with a failure announcement. This is a standard announcement, unlike the equivalent failure in Number Validation where a specific tone or announcement can be selected.
- The **Action** field indicates that the call cannot be routed using the current Routing Table and should be returned for re-routing. In this case, processing returns to the previous Routing Table and continues with an alternative matching Routing Action from that table, if one can be found.

This action can be used to provide negative matching in a Routing Table. If the selected Routing Action indicates "return for reroute", no further Routing Actions in that table will be considered for routing the call. For example, if you have a Routing Table that controls use of a particular carrier, this allows you to ensure that calls with a particular number prefix (identified by the **Wildcard address** fields on the Routing Action) will not be routed using this carrier.

2.5.1 Rerouting

In addition to the "return for reroute" action described above, there are other circumstances in which routing can automatically return to the last routing table processed and process it again, resulting in a different outcome. This can occur only if the maximum number of routing table lookups has not been exceeded.

In particular, Automatic Alternative Routing (AAR) and Automatic Re-Routing (ARR) are allowed by default for all calls, unless the corresponding attribute has been explicitly set to **False** in a Routing Action for the call. AAR and ARR are typically used to implement the following features:

- **Overflow routing**, where an alternative trunk is selected if the first-choice trunk has no spare capacity.
- **Choke trunks**, where calls are rejected if the first-choice trunk has no spare capacity (for example, this can be used to limit calls in radio phone-ins or telephone voting).

Circumstances in which automatic re-routing may occur are as follows.

- An action cannot be selected in the current table. For example, if the table type is call gapping and none of the Routing Actions have completed the interval imposed before they can be selected again.
- When Call Routing has selected a media channel, that media channel is checked against information stored by Routing Policy Services. This checks whether the media channel is currently active and if so, its level of congestion. If the media channel is inactive or the level of congestion is unsatisfactory, routing fails. If Automatic Alternative Routing (AAR) is allowed, routing can be retried.
- When Call Routing has selected a media channel, it checks the state of the corresponding signaling stack. If this is too congested or unavailable, routing fails. If Automatic Re-Routing (ARR) is allowed, routing can be retried.
- When Call Routing has selected a media channel, it checks the bearer types (voice, data, ...) supported on the media channel against the bearer type of the call. If the media channel does not support the bearer type of the call (for example, an attempt to route an ISDN data call over a voice-only MF trunk), routing fails. If Automatic Re-Routing (ARR) is allowed, routing can be retried.

If the call fails after successful call routing (for example if signaling fails because of congestion), and Automatic Re-Routing (ARR) is allowed, the call will be re-routed. If the failed routing attempt was over an ISUP or ISDN trunk, you can match on the release cause (if any) signaled by the remote system to determine how to re-route the call. For more details, see the description of the **Routing Action** object (section 3.1.23). For MF, SIP or SIP-T trunks, you can match on the presence or absence of a release cause, but not on a specific value.

In a similar way, the MetaSwitch NE provides a release cause when rejecting an incoming routing attempt received over an ISUP or ISDN trunk. If necessary, you can override this with a specific value to help the remote system determine how to re-route the call; see the description of the **Outgoing ISUP/ISDN release cause** attribute in the **Attribute Entry** or **Routing Action** object (section 3.1.14 or 3.1.23).

2.6 911 Support for Nomadic VoIP Subscribers

If the MetaSwitch NE supports nomadic VoIP subscribers (subscribers who can access their VoIP service from multiple locations), these subscribers need to register their current location so that 911 (emergency) calls can be routed to the correct PSAP. The MetaSwitch NE provides support for this using either the Intrado E911 service or the Dash911 service provided by Telefinity, as follows. Please contact your MetaSwitch support representative for more information about how to set up the NE to operate with Intrado or Dash911.

- You will need to license the service from Intrado or Telefinity, who will provide details of how to access it.
- The routing attributes defined for a subscriber (or set up in number validation) indicate whether the subscriber is a nomadic subscriber. The Routing tables must be set up to forward 911 calls from these subscribers to the Intrado or Dash911 server.
- Intrado and Dash911 provide web servers on which nomadic subscribers can set up and update their current location details. The MetaSwitch Web Self-Care interface provides a link to this server, so that subscribers can access it from within Web Self-Care.
- The MetaSwitch EMS also allows you to update the location information on behalf of a subscriber (for example when you first provide service to the subscriber, or in response to a telephone request). The Nomadic Subscriber Support object in the EMS (described in *Operations Manual: Overview*) provides access to a subscriber's entry on the Intrado or Dash911 web server so that you can update the information on the subscriber's behalf.
 - For Intrado, the EMS provides a temporary copy of the details (transferred between the Intrado server and the EMS Server) so that you can view and edit them within the EMS interface. These details are stored on the Intrado server, not in the EMS.
 - For Dash911, the EMS provides a link to the subscriber's entry on the Dash911 web server in a similar way to the link from Web Self-Care, so that you can update the information on the subscriber's behalf. Note that this function is available only from an EMS Client running on Windows (and not from an EMS Client running on Solaris).



If your MetaSwitch NE supports nomadic subscribers, it is important that you configure E911 support correctly so that subscribers can update their location details, and so that 911 calls for these subscribers are routed to the Intrado or Dash911 server. If the configuration is not set up correctly, 911 calls made by these subscribers may not be routed to the correct PSAP, which may result in a delay in obtaining emergency service.

Please contact your MetaSwitch support representative for more information about how to set up Intrado or Dash911 access.

3. Routing

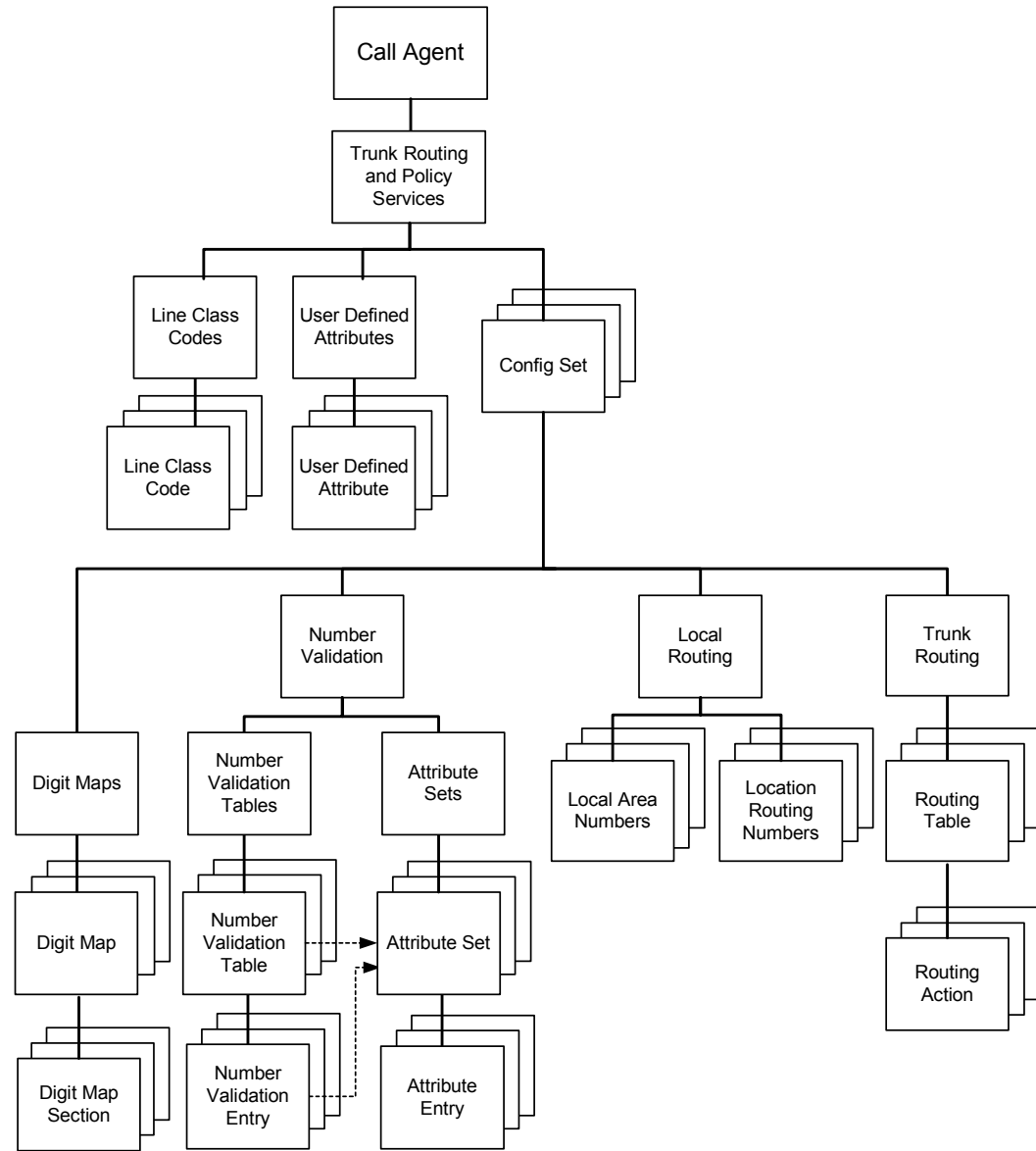
This chapter explains how to configure the Digit Maps, Number Validation tables, and Routing tables used by the MetaSwitch NE.

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3.1 Objects

Figure 2 shows the Routing configuration objects and how they are related.

Figure 2. Routing Objects



3.1.1 Finding Routing Objects

You can use the EMS System Explorer's Find panels to find Attribute Sets, Number Validation Tables or Routing Tables with a specific name or index. To do this, use the Find menu, and select the appropriate **Find** panel from this menu. Alternatively, expand the Find entry in the View Selection panel on the left of the System Explorer window, and select the appropriate object type from the displayed list of Find options.

For more details, see the description of the Find panels in *Operations Manual: Overview*.

3.1.2 Trunk Routing and Policy Services

The Trunk Routing and Policy Services object is a child of the Call Agent object.

The object contains configuration parameters for the Routing Policy Services component of the MetaSwitch NE. There is only a single Trunk Routing and Policy Services object, which is created before delivery and which you cannot destroy.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✓ Import	✓ Export	✓ Output

Parameter	Access	Description
Trunk Routing Config Set	Change	Config Set to be used to process all routing operations. Select from the displayed list of Config Sets. Note that a Config Set appears in this list only if its Ready for use field is set to True .
Maximum number of routing requests	Change	The maximum number of times a user of Routing Policy Services may retry the routing request for a single routing operation. Routing Policy Services will fail the routing operation rather than exceed this limit. The default is 3.
Maximum number of routing table lookups	Change	The maximum number of routing table lookups Routing Policy Services may execute for a single routing operation. Routing Policy Services will fail the routing operation rather than exceed this limit. The default is 10.
Maximum time between usage reports	Read only	The maximum time in milliseconds between successive reports of media channel usage from signaling stacks.
Child Attention Required alarms	Read only	The total number of children of this object that are in Attention Required state.
Child Attention Required alarm events	Read only / Reset	The total number of times that the alarm state for a child object has gone to Attention Required .

Parameter	Access	Description
Child Attend To Dependent alarms	Read only	The total number of children of this object that are in Attend To Dependent state.
Child Attend To Dependent alarm events	Read only / Reset	The total number of times that the alarm state for a child object has gone to Attend To Dependent .
Summary child alarm state	Read only	Summarizes the alarm status for all children of this object. Values: <ul style="list-style-type: none"> • Clear No alarms are currently raised. • Attention Required Attention Required - one or more child objects are not operating normally, and need operator intervention. • Attend To Dependent Attention Required elsewhere - another object on which one or more child objects depend is not operating normally.
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed

Parameter	Access	Description
Import – mode	Change	<p>Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values:</p> <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.</p>
Import – log correlator	Read only	<p>If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Import - correlator metaswitch	Read only	<p>If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>


Parameter	Access	Description
Export - number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export - status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export - log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.


Parameter	Access	Description
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.

3.1.3 Line Class Codes

The Line Class Codes object does not have any modifiable fields or pushbuttons, and you cannot configure or manage it. It exists simply as a way of grouping the individual Line Class Code objects.

The Line Class Codes object is a child of the Trunk Routing and Policy Services object.

To view details of individual Line Class Codes, click on the  symbol next to the Line Class Codes object.

To hide individual Line Class Codes, click on the  symbol next to the Line Class Codes object.

Actions

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Create | <input checked="" type="checkbox"/> Enable | <input checked="" type="checkbox"/> Activate |
| <input checked="" type="checkbox"/> Delete | <input checked="" type="checkbox"/> Disable | <input checked="" type="checkbox"/> Deactivate |
| <input checked="" type="checkbox"/> Apply | <input checked="" type="checkbox"/> Reset Statistics | <input checked="" type="checkbox"/> Refresh |
| <input checked="" type="checkbox"/> Import | <input checked="" type="checkbox"/> Export | <input checked="" type="checkbox"/> Output |

Parameter	Access	Description
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed

Parameter	Access	Description
Import – mode	Change	<p>Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values:</p> <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	<p>The name of the text file (in the EMS User’s home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.</p>
Import – log correlator	Read only	<p>If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the ‘go to log’ button next to this field to jump to this message in the EMS log viewer window.</p>
Import - correlator metaswitch	Read only	<p>If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

Parameter	Access	Description
Export - number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export - status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export - log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.

Parameter	Access	Description
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.

3.1.4 Line Class Code

Line Class Codes are provided as an extension to allow you to perform routing that is specific to your deployment and cannot be controlled by other attributes; many deployments may not require them.

The Line Class Code (LCC) object is a child of the Line Class Codes object. It allows you to define a name for a Line Class Code, how it is used, and optionally one or more values that can be used for this code and their meanings.

The MetaSwitch Class 4/5 Softswitch does not assign a specific meaning to any particular Line Class Code or its value. You can define a maximum of 20 codes, each with a meaning specific to your deployment, and assign numeric values as required.

In the configuration of a subscriber (Individual Line, Business Group, Business Group Line, or PBX), or in a Persistent Profile, you can set one or more of the Line Class Codes you have defined to an integer value; you can then match these values during Number Validation and Routing to determine how to route the call. If any of these codes is not set in subscriber configuration, the attribute value defaults to zero.

Actions

- | | | |
|----------|--------------------|--------------|
| ✓ Create | ✗ Enable | ✗ Activate |
| ✓ Delete | ✗ Disable | ✗ Deactivate |
| ✓ Apply | ✗ Reset Statistics | ✓ Refresh |
| ✗ Import | ✓ Export | ✓ Output |

Parameter	Access	Description
Index	Create	The EMS's identifier for this Line Class Code object. Specify a number in the range 1 - 20.
Display name	Change	Optional user-friendly text description identifying the meaning of this Line Class Code. This is used to identify the Line Class Code wherever it appears in subscriber or routing configuration (for example in the field name shown for this Line Class Code in the Individual Line object, or in the attribute name shown for this Line Class Code when you select it as a routing attribute). If you specify a display name, it must not match the display name of any other Line Class Code.

Parameter	Access	Description
Access	Change	<p>Specifies whether EMS users can modify the value of this Line Class Code on an active Individual Line, Business Group Line or PBX. Values:</p> <ul style="list-style-type: none">• Change anytime (default) EMS users can modify a subscriber's value of this Line Class Code at any time.• Change inactive EMS users can modify a subscriber's value of this Line Class Code only when the subscriber is inactive. <p>The Change inactive value only affects changes made directly to the value of the Line Class Code for an Individual Line, Business Group Line or PBX object in the EMS. Any subscriber who inherits the value of this Line Class Code (using the Use default option) will be affected by any changes in the inherited value. For example, if a Persistent Profile is updated, any subscribers inheriting Line Class Codes from that Profile will receive the new value, regardless of whether or not they are inactive.</p>
Allow inheritance	Change	<p>Specifies whether the value for this Line Class Code can be inherited as a default (using the Use default option) when configuring an Individual Line, Business Group Line, or PBX. Values:</p> <ul style="list-style-type: none">• True (default) The value can be inherited.• False The value cannot be inherited and must be specified. The EMS will reject an attempt to select the Use default option.

Parameter	Access	Description
Variant	Change	<p>Specifies whether the value of this code in the configuration of an Individual Line, Business Group Line, PBX, or Persistent Profile can be any numeric value, or must be one of the values specified in the Values field below.</p> <p>Values:</p> <ul style="list-style-type: none">• Validated This code must be set to one of the values in the Values field.• Non-validated (default) This code can be set to any numeric value.

Parameter	Access	Description
Values	Change	<p>One or more valid values for this Line Class Code. The values you specify here will be available for selection when you are configuring a value for this code in routing or subscriber configuration. If Variant is set to Validated, you must specify at least one value.</p> <p>This field is a text field in which you can copy, cut, and paste text. To add or edit code values in this field, specify each code on its own line, terminated by a carriage return.</p> <ul style="list-style-type: none"> • The code value must be at the start of the line, and must be a string of numeric digits 0-9. You cannot include two entries with the same value in the same table. • You can include an optional text description of the code value on the same line (maximum 64 characters), separated from the value itself by a space character. (This text can include accented / international characters as defined in ISO 8859-1.) If you include a description, it must not match the description of any other code value for this Line Class Code. <p>When you apply any changes, the EMS will display the code values sorted into numerical order, with one space between each code value and its description. The following is an example of valid code values:</p> <pre>201200 Jersey City, NJ 201201 Elsewhere in NJ 201205 201999 All other states</pre>
Export - number of objects exported	Read only	<p>The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.</p>

Parameter	Access	Description
Export - status	Read only	<p>The status of the current or most recent export operation, if any. Values:</p> <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.</p>
Export - log correlator	Read only	<p>If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Export - correlator metaswitch	Read only	<p>If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

3.1.5 User Defined Attributes

The User Defined Attributes object does not have any modifiable fields or pushbuttons, and you cannot configure or manage it. It exists simply as a way of grouping the individual User Defined Attribute objects.

The User Defined Attributes object is a child of the Trunk Routing and Policy Services object.

To view details of individual User Defined Attributes, click on the symbol next to the User Defined Attributes object.

To hide individual User Defined Attributes, click on the symbol next to the User Defined Attributes object.

Actions

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Create | <input checked="" type="checkbox"/> Enable | <input checked="" type="checkbox"/> Activate |
| <input checked="" type="checkbox"/> Delete | <input checked="" type="checkbox"/> Disable | <input checked="" type="checkbox"/> Deactivate |
| <input checked="" type="checkbox"/> Apply | <input checked="" type="checkbox"/> Reset Statistics | <input checked="" type="checkbox"/> Refresh |
| <input checked="" type="checkbox"/> Import | <input checked="" type="checkbox"/> Export | <input checked="" type="checkbox"/> Output |

Parameter	Access	Description
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed

Parameter	Access	Description
Import – mode	Change	<p>Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values:</p> <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.</p>
Import – log correlator	Read only	<p>If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Import - correlator metaswitch	Read only	<p>If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

Parameter	Access	Description
Export - number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export - status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export - log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.

Parameter	Access	Description
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.

3.1.6 User Defined Attribute

User Defined Attributes are provided as an extension to allow you to perform routing that is specific to your deployment and cannot be controlled by other attributes; many deployments may not require them.

The User Defined Attribute (UDA) object is a child of the User Defined Attributes object. It allows you to define a name for a specific User Defined Attribute, to help you identify how it is used.

The MetaSwitch Class 4/5 Softswitch does not assign a specific meaning to any particular User Defined Attribute or its value. You can define a maximum of 20 User Defined Attributes, each with a meaning specific to your deployment, and assign numeric values as required.

Actions

✓ Create	✗ Enable	✗ Activate
✓ Delete	✗ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✓ Export	✓ Output

Parameter	Access	Description
Index	Create	The EMS's identifier for this User Defined Attribute object. Specify a number in the range 1 - 20.
Display name	Change	Optional user-friendly text description identifying the meaning of this User Defined Attribute. This is used to identify the attribute wherever it appears in routing configuration (for example in the attribute name shown for this User Defined Attribute when you select it as a routing attribute). If you specify a display name, it must not match the display name of any other User Defined Attribute.

3.1.7 Config Set

The Config Set objects are children of the Trunk Routing and Policy Services object.

Each Config Set object defines a consistent set of Number Validation and Routing parameters for Routing and Policy Services. The Config Set defines the initial Routing Table and a default Attribute Set and initial Number Validation Table for each called address type.

At any time, only one Config Set can be selected for use by Trunk Routing and Policy Services. You cannot modify this selected object or perform any actions on it. However, you can create an additional Config Set with the new parameters you want to use, either by creating it as a new object or by copying an existing Config Set and modifying the parameters as required. You can then activate it (which performs consistency checks to verify that the parameters you have specified are appropriate), and modify Trunk Routing and Policy Services to select the new Config Set.



A Config Set must have **Ready for use** set to **True** before that Config Set can be selected for use by the active Trunk Routing and Policy Services. In order to make the Config Set **Ready for use**, it must contain a Digit Map with the same name as each Digit Map in the active Config Set that is in use by one or more Subscriber Groups.

If Trunk Routing and Policy Services is not active, the selected Config Set need not be ready for use, but Trunk Routing and Policy Services cannot be activated until the selected set is ready for use.

Actions

- | | | |
|----------|--------------------|--------------|
| ✓ Create | ✓ Enable | ✓ Activate |
| ✓ Delete | ✓ Disable | ✓ Deactivate |
| ✓ Apply | ✗ Reset Statistics | ✓ Refresh |
| ✓ Import | ✓ Export | ✓ Output |

Object-Specific Actions

Copy To create a new Config Set with the same configuration as this one, together with its child Digit Maps, Routing Tables and Number Validation Tables, click on the 'Copy' pushbutton. The EMS will create and display the new object. The only field not copied from the existing object is **Config Set name**; you can then specify a new name to identify the new object.

Parameter	Access	Description
Config Set type	Create	Type of the Config Set. Values: <ul style="list-style-type: none">• Basic (default) RPS uses the routing actions, routing tables and routing entries, as configured by the user.• No LNP lookup (North America only) RPS should use special code to calculate routes in a North American telephone network without performing LNP lookup.• LNP lookup (North America only) RPS should calculate routes in a North American telephone network by performing LNP lookup.• UK routing RPS should use special code to calculate routes in a UK telephone network.
Config Set name	Change	An optional name to identify the Config Set. Specify a name of up to 64 characters. If you create a new Config Set by copying an existing one, this field is left blank in the new object, but you can fill in a new name after creating it.
Config Set usage	Change	Specifies whether the Config Set allows the MetaSwitch NE to support transit calls (calls that are routed from one network to another through the NE and do not originate or terminate at a MetaSwitch subscriber). If required, select the following value: <ul style="list-style-type: none">• Transit calls allowed The MetaSwitch NE can support transit calls.

Parameter	Access	Description
Initial Routing Table	Change	<p>Initial Routing Table for each routing operation. Select from the displayed list of currently enabled child Routing Tables.</p> <p>As a short-cut to select the Routing Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>
Routing Table – remote LNP lookup	Change	<p>This field is visible only if the Config Set type is No LNP lookup or LNP lookup. It specifies the Routing Table to be used when LNP lookup is required. This enables routing to an exchange capable of performing LNP lookup. Select from the displayed list of currently enabled Routing Tables.</p> <p>As a short-cut to select the Routing Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>

Parameter	Access	Description
Number Validation Table – dialed digits	Change	<p>Initial Number Validation Table to use if the called address is a dialed digits address. Select from the displayed list of currently enabled Number Validation Tables or select None for no validation of dialed digit addresses. The default is None.</p> <p>As a short-cut to select the Number Validation Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>
Attribute Set – dialed digits	Change	<p>Initial Attribute Set to apply if the called address is a dialed digits address. Select from the displayed list of currently enabled Attribute Sets. These attributes will override attributes received in the routing request and will be used in number validation decisions. Select None if you do not want to update any attributes.</p> <p>As a short-cut to select the Attribute Set, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>

Parameter	Access	Description
Number Validation Table – E.164 addresses	Change	<p>Initial Number Validation Table to use if the called address is an E.164 address. Select from the displayed list of currently enabled Number Validation Tables or select None for no validation of E.164 addresses. The default is None.</p> <p>As a short-cut to select the Number Validation Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>
Attribute Set – E.164 addresses	Change	<p>Initial Attribute Set to apply if the called address is an E.164 address. Select from the displayed list of currently enabled Attribute Sets. These attributes will override attributes received in the routing request and will be used in number validation decisions. Select None if you do not want to update any attributes.</p> <p>As a short-cut to select the Attribute Set, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>

Parameter	Access	Description
Number Validation Table – carrier IDs	Change	<p>Initial Number Validation Table to use to validate a carrier ID. Select from the displayed list of currently enabled Number Validation Tables or select None for no validation of carrier IDs. The default is None.</p> <p>As a short-cut to select the Number Validation Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>
Attribute Set – carrier IDs	Change	<p>Initial Attribute Set to apply before validating a carrier ID. Select from the displayed list of currently enabled Attribute Sets. These attributes will override attributes received in the routing request and will be used in any number validation decisions performed by the carrier table. Select None if you do not want to update any attributes.</p> <p>As a short-cut to select the Attribute Set, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>

Parameter	Access	Description
On-switch carrier	Change	The carrier ID to treat as the on-switch carrier when processing calls routed to a Feature Group D carrier. Enter the carrier ID as 4 decimal digits. If the carrier selected for a call corresponds to this carrier, a carrier is not required because the destination is a subscriber on the switch. The default is 0.
Number Validation Table - post ANI Screening lookup	Change	Number Validation Table to use when restarting Number Validation after an ANI Screening lookup. Select from the displayed list of currently enabled Number Validation Tables, or select None if you are not using ANI Screening. The default is None . As a short-cut to select the Number Validation Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B* , a range such as CA-FL , an index value such as =3 , or an index range such as =1-20 . For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i> .

Parameter	Access	Description
Number Validation Table - post Authorization Code collection	Change	<p>Number Validation Table to use when restarting Number Validation after an Authorization Code lookup. Select from the displayed list of currently enabled Number Validation Tables, or select None if you are not using Authorization Codes. The default is None.</p> <p>As a short-cut to select the Number Validation Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>
Force trunk routing	Change	<p>Specifies whether calls from subscribers with specific routing attributes should always be routed using trunk routing rather than on-switch routing. If required, select the following value:</p> <ul style="list-style-type: none">• Pre-paid / off-switch calling card subscriber If the subscriber uses a pre-paid or off-switch calling card service, calls from this subscriber are always routed using trunk routing (to allow checking with the pre-paid billing database). The default is to force trunk routing for these subscribers.
Ready for use	Read only	<p>Specifies whether the Config Set is ready for use as the active Config Set. Values:</p> <ul style="list-style-type: none">• True The Config Set is ready for use.• False The Config Set is not ready for use. This is because the active Config Set includes a Digit Map that is in use by one or more Subscriber Groups, but there is no Digit Map with the same name in this Config Set.

Parameter	Access	Description
Alarm state	Read only	Specifies whether any alarms are currently raised for this object. Values: <ul style="list-style-type: none">• Clear No alarms are currently raised.• Attention Required Attention Required - the object is not operating normally, and needs operator intervention.• Attend To Dependent Attention Required elsewhere - another object on which this object depends is not operating normally.
Alarm log correlator - Attention Required	Read only	Identifier of the log message for the event that caused the last Attention Required alarm state for this object. This field is reset when the Attention Required alarm events field is reset to zero.
Attention Required alarm events	Read only / Reset	Number of times (since the alarm count was reset) that this object's alarm state has gone to Attention Required .
Alarm state changed timestamp	Read only	The time at which the Alarm state last changed.
Alarm events reset timestamp	Read only	The time at which the Attention Required alarm events was last reset to zero.
Trunk Routing Attend To Dependent alarms	Read only	The total number of Attend To Dependent alarms for the Trunk Routing child object (and its child objects).
Trunk Routing Attend To Dependent alarm events	Read only / Reset	The total number of times that the alarm state for the Trunk Routing child object (or one of its child objects) has gone to Attend To Dependent .

Parameter	Access	Description
Summary child alarm state	Read only	Summarizes the alarm status for all children of this object. Values: <ul style="list-style-type: none">• Clear No alarms are currently raised.• Attention Required Attention Required - one or more child objects are not operating normally, and need operator intervention.• Attend To Dependent Attention Required elsewhere - another object on which one or more child objects depend is not operating normally.
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none">• None• In progress• Succeeded• Failed

Parameter	Access	Description
Import – mode	Change	<p>Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values:</p> <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.</p>
Import – log correlator	Read only	<p>If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Import - correlator metaswitch	Read only	<p>If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

Parameter	Access	Description
Export – number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export – status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export – file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export – log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.

Parameter	Access	Description
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.
Requested status	Read only	<p>Specifies whether an administrator has attempted to activate the Config Set. Values:</p> <ul style="list-style-type: none"> • Active The object has been activated. • Inactive The object has not been activated or has been deactivated. • Disabled The object has been disabled.
Actual status	Read only	<p>Specifies the current status of the Config Set. Values:</p> <ul style="list-style-type: none"> • Active The object is active. • Activating Activation is in progress. • Deactivating Deactivation is in progress. • Inactive The object is inactive. • Disabled The object has been disabled. • Activation Failed The object is inactive because an activation attempt has failed. • Failed The object was active but has failed. • Quiescing The object is preparing for normal deactivation. It is operating normally but will not accept any new users. • Waiting For Parent The object cannot be used because its parent object is not yet active. • Parent Failed The object cannot be used because its parent object has failed.

3.1.8 Digit Maps


Each Digit Map object (described in section 3.1.9, **Digit Map**) defines the valid digit sequences for a different dial plan. Because there may be a large number of these objects, the EMS System Explorer groups them all under a single Digit Maps object. This grouping allows you to hide the individual Digit Map objects in the Tree View panel so that you can concentrate on other objects in the tree.


The Digit Maps object includes fields and pushbuttons for importing and exporting the configuration of its child Digit Map objects, as described in *Operations Manual: Overview*. Apart from these fields, you cannot configure or manage it. It exists simply as a way of grouping the individual Digit Map objects.

The Digit Maps object is a child of the Config Set object.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✗ Apply	✗ Reset Statistics	✓ Refresh
✓ Import	✓ Export	✓ Output

To view details of individual digit maps, click on the  symbol next to the Digit Maps object. Click on the entry for an individual digit map to view its details.

To hide individual digit maps, click on the  symbol next to the Digit Maps object.

Parameter	Access	Description
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed

Parameter	Access	Description
Import – mode	Change	<p>Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values:</p> <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.</p>
Import – log correlator	Read only	<p>If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Import - correlator metaswitch	Read only	<p>If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

Parameter	Access	Description
Export - number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export - status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export - log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.

Parameter	Access	Description
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.

3.1.9 Digit Map

The Digit Map object is a child of the Digit Maps object.

Each Digit Map object defines the valid digit sequences for a specific dial plan. A digit map consists of multiple digit map sections in which the digit sequences are defined. A Digit Map cannot be enabled until at least one child Digit Map Section is enabled.

The Subscriber Group object specifies which Digit Map is used for calls made by subscribers within that group.



You cannot create or modify a Digit Map or perform any actions on it while its parent Config Set is active.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✓ Export	✓ Output

Parameter	Access	Description
Digit Map name	Change Inactive	Unique user-friendly name identifying the Digit Map. Digit Maps must begin with an alphabetic character (in upper or lower case) and can contain only alphabetic, numeric or underscore characters. Specify a name of up to 64 characters.
Description	Change Inactive	A text string used in the EMS System Explorer to identify this Digit Map. Specify a string of up to 64 characters.
Number of references from Subscriber Groups	Read only	The number of Subscriber Group objects that refer to this Digit Map. This field appears only when this Digit Map is a child of the active Config Set.

Parameter	Access	Description
Critical timer value	Change	<p>This parameter applies only to Media Gateways controlled using Megaco, and not to third-party gateways controlled using MGCP.</p> <p>Length of the critical interdigit timer. When the dialed digit sequence so far results in a match in the digit map but could also be the prefix of another matching sequence (for example if the dialed string is 123 and both 123 and 12345 are valid matches), this timer is used to distinguish between the two. If no further digits are dialed within this time, the shorter string is matched.</p> <p>Range: 0 - 99 seconds. The value must be less than Partial timer value if both are non-zero. A value of 0 (zero) indicates that the Media Gateway's default timer value should be used; for a MetaSwitch Media Gateway this is 4s.</p>
Partial timer value	Change	<p>This parameter applies only to Media Gateways controlled using Megaco, and not to third-party gateways controlled using MGCP.</p> <p>Length of the partial interdigit timer. When the dialed digit sequence so far does not result in a match in the digit map but could be the prefix of another matching sequence (for example if the dialed string is 123 and 12345 is a valid match), this timer is used to wait for further digits. If no further digits are dialed within this time, the sequence is considered a mismatch.</p> <p>Range: 0 - 99 seconds. The value must be greater than Critical timer value if both are non-zero. A value of 0 (zero) indicates that the Media Gateway's default timer value should be used; for a MetaSwitch Media Gateway this is 16s.</p>
Export - number of objects exported	Read only	<p>The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.</p>

Parameter	Access	Description
Export - status	Read only	<p>The status of the current or most recent export operation, if any. Values:</p> <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.</p>
Export - log correlator	Read only	<p>If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Export - correlator metaswitch	Read only	<p>If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

Parameter	Access	Description
Requested status	Read only	<p>Specifies whether an administrator has attempted to activate the Digit Map. Values:</p> <ul style="list-style-type: none"> • Active The object has been activated. • Inactive The object has not been activated or has been deactivated. • Disabled The object has been disabled.
Actual status	Read only	<p>Specifies the current status of the Digit Map object. Values:</p> <ul style="list-style-type: none"> • Active The object is active. • Activating Activation is in progress. • Deactivating Deactivation is in progress. • Inactive The object is inactive. • Disabled The object has been disabled. • Activation Failed The object is inactive because an activation attempt has failed. • Failed The object was active but has failed. • Quiescing The object is preparing for normal deactivation. It is operating normally but will not accept any new users. • Waiting For Parent The object cannot be used because its parent object is not yet active. • Parent Failed The object cannot be used because its parent object has failed.

3.1.10 Digit Map Section

The Digit Map Section object is a child of the Digit Map object.

This object defines a section of a digit map. All Digit Map Sections that have the same parent Digit Map are combined to produce the complete digit map. Each Digit Map Section specifies a string, in the format described in **Digit Map Section format** below, of up to 255 characters.



You cannot create or modify a Digit Map Section or perform any actions on it while its grandparent Config Set is active.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✗ Export	✓ Output

Parameter	Access	Description
Section name	Change Inactive	User-friendly name identifying this section of the Digit Map. For example, “International” could denote a section of the Digit Map containing international dialing plans, and “Emergency” could denote a section of the Digit Map containing emergency operator dialing plans. The name must be unique within the parent Digit Map. Specify a name of up to 32 characters.
Digit Map Section	Change Inactive	A string containing a section of digit map. Specify a string of up to 255 characters, in the format described in Digit Map Section format below.
Requested status	Read only	Specifies whether an administrator has attempted to enable the Digit Map Section. Values: <ul style="list-style-type: none"> • Enabled The object has been enabled. • Disabled The object has not been enabled or has been disabled.

Parameter	Access	Description
Actual status	Read only	Specifies the current status of the Digit Map Section. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

Digit Map Section format

Each digit map section is specified as an ASCII string enclosed in parentheses. It can contain a number of entries separated by vertical lines, but there are no vertical lines at the start or end of the string.

- The character X represents any numerical digit 0 - 9.
- The period (dot) character represents zero or more repetitions of the previous character.
- Two or more numbers within square brackets mean that exactly one of these numbers is used: [01]X means 0X or 1X. A range of numbers in square brackets means that any one of the numbers can be used: [013-5]X means 0X, 1X, 3X, 4X or 5X.
- The character T represents expiry of the interdigit timer. The interdigit timer is restarted after each digit is entered.

The example below shows a simple digit map section with a small number of entries.

```
(0T|101T|101XXXX|[2-9]11|1[2-9]XXXXXXXXXX|011X.|[X*].#)
```

3.1.11 Number Validation

The Number Validation object is a child of the Config Set. It does not have any configurable parameters, but is used to group together the Attribute Set and Number Validation Table objects and to provide overall status information for them.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✓ Apply	✓ Reset Statistics	✓ Refresh
✓ Import	✓ Export	✓ Output

Parameter	Access	Description
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed
Import – mode	Change	Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values: <ul style="list-style-type: none"> • Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them. • Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them. • Overwrite or create No checking. The import operation will create or update objects as required.

Parameter	Access	Description
Import – file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.
Import – log correlator	Read only	If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.
Import - correlator metaswitch	Read only	If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.
Export – number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.

Parameter	Access	Description
Export – status	Read only	<p>The status of the current or most recent export operation, if any. Values:</p> <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export – file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.</p>
Export – log correlator	Read only	<p>If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Export - correlator metaswitch	Read only	<p>If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

3.1.12 Attribute Sets

Each Attribute Set (described in section 3.1.13, **Attribute Set**) defines a set of parameters to be added to a routing request during the number validation process. Because there may be a large number of these objects, the EMS System Explorer groups them all under a single Attribute Sets object. This grouping allows you to hide the individual Attribute Set objects in the Tree View panel so that you can concentrate on other objects in the tree.

The Attribute Sets object includes fields and pushbuttons for importing the configuration of its child Attribute Set objects, as described in *Operations Manual: Overview*. Apart from these fields, you cannot configure or manage it. It exists simply as a way of grouping the individual Attribute Set objects.

The Attribute Sets object is a child of the Number Validation object.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✓ Import	✗ Export	✓ Output

To view details of individual attribute sets, click on the symbol next to the Attribute Sets object. Click on the entry for an individual attribute set to view its details.

To hide individual attribute sets, click on the symbol next to the Attribute Sets object.

Parameter	Access	Description
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed

Parameter	Access	Description
Import – mode	Change	Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values: <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.
Import – log correlator	Read only	If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.
Import - correlator metaswitch	Read only	If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.

3.1.13 Attribute Set

Each Attribute Set object is a child of the Attribute Sets object.

When a Number Validation Entry is matched, the Attribute Set referenced by that entry is used to update the parameters that are added to the routing request during the number validation process. If no Number Validation Entry can be matched in a particular Number Validation Table, the default Attribute Set referenced by the Number Validation Table is used instead.

An Attribute Set normally has a number of child Attribute Entries, each specifying a parameter that is to be updated in the routing request. You can also create an empty Attribute Set with no Attribute Entries; this is used when the default Attribute Set for a Number Validation Table specifies one or more attributes to be updated, but a specific Number Validation Entry in the table requires no attribute updates and so overrides the default by specifying an empty Attribute Set.



Note that when the parent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the parent Config Set before you can modify the object.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✓ Export	✓ Output

Parameter	Access	Description
Attribute Set index	Create	Unique numerical index identifying the Attribute Set. This field is optional; if you do not supply a value, the EMS assigns one.
Attribute Set name	Change	Unique user-friendly name identifying the Attribute Set. Specify a name of up to 64 characters. If a name is not specified, the EMS displays a default.
References count	Read only	Number of Number Validation Tables or Number Validation Entries that refer to this Attribute Set. Note that a Default Attribute Set field in a Number Validation Table specifying this attribute set counts as a single reference.

Parameter	Access	Description
Export - number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export - status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export - log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.

Parameter	Access	Description
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.
Requested status	Read only	Specifies whether an administrator has attempted to enable the Attribute Set. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of the Attribute Set. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

3.1.14 Attribute Entry

Each Attribute Entry object is a child of an Attribute Set object.

Each object defines a single attribute (consisting of a type and a value) that may be added to the routing request during the number validation process.



Note that when the grandparent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the grandparent Config Set before you can modify the object.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✗ Export	✓ Output

Parameter	Access	Description
Attribute type	Change	<p>Type of the attribute defined in this object. See the description of each Attribute value parameter below for more details of each attribute type.</p> <p>Values:</p> <ul style="list-style-type: none"> • Allowed carrier call type (North America only) • Allowed dialing pattern (North America only) • ANI II digits (North America only) • ANI Screening lookup (North America only) • Announcement ID • Announcement Parameter 1 • Announcement Parameter 2 • Area code dialed • Authorization Code Service (North America only) • Billing - call type • Billing - structure code • Billing - override AIN billing (North America only) • Called address complete • Called address scope • Called address type • Call hold allowed • Calling category • Call type (North America only)

Parameter	Access	Description
		<ul style="list-style-type: none"> • Carrier call type (North America only) • Carrier type (North America only) • Country code length • Customer announcement ID • Dialed prefix (North America only) • Dialing pattern (North America only) • Echo cancellation • FGD carrier ID (North America only) • FGD carrier dialing allowed (North America only) • FGD carrier requirement (North America only) • Force LNP lookup (North America only) • Force on-switch lookup • IN query ANI NPA (North America only) • IN query ANI NPA-NXX (North America only) • IN query ANI 1st preference (North America only) • IN query ANI 2nd preference (North America only) • IN query ANI 3rd preference (North America only) • IN trigger index (North America only) • IN US trigger match type (North America only) • ISUP called address prefix (North America only) • Maximum call duration • Message Billing Index • Number type for ANI lookup (North America only) • Operator call • Outgoing ISUP/ISDN Release Cause • Permit when service suspended • Priority call • Pseudo ANI egress signaling types (North America only)

Parameter	Access	Description
		<ul style="list-style-type: none"> • Pseudo ANI presentation indicator (North America only) • Region code (North America only) • Release control mode (UK only) • Restricted line 950 call (North America only) • Routing control (UK only) • Signal access signaling for operator call (North America only) • Signaling FGD carrier ID (North America only) • Signaling Gateway • Test call • Transit Network ID (North America only) • UK call type (UK only) • Use modified operator NOA encoding (North America only) • Use operator requested NOA encoding (North America only) • Use Pseudo ANI (pANI) (North America only) • User Defined Attribute 1 - User Defined Attribute 20 Each of the 20 User Defined Attribute options appears in this list only if you have configured a User Defined Attribute object with the corresponding numeric index value. It appears as UDA <i>n</i> - description (showing the index value in the range 1-20 and the configured description, if any). • User defined MF call type (North America only) • US LATA (North America only)

Parameter	Access	Description
Attribute value – allowed carrier call type	Change	<p>This field appears only if Attribute type is set to Allowed carrier call type. Specifies the carrier call types that may be used for a particular carrier. This is compared with the actual carrier call type set for the call at the end of number validation; if there is a mismatch, an appropriate error message is played. This attribute can be set up only in the Carrier Table, not in the main validation tables. Select one or more of the values:</p> <ul style="list-style-type: none">• International - not world zone 1• International - world zone 1• InterLATA• IntraLATA• InterLATA CDR (default)
Attribute value – allowed dialing pattern	Change	<p>This field appears only if Attribute type is set to Allowed dialing pattern. Specifies the dialing patterns that may be used. This is compared with the actual dialing type for the call at the end of number validation and if there is a mismatch, an appropriate error message is played. Select one or more of the values:</p> <ul style="list-style-type: none">• 7 digits• 10 digits• 1+10 digits• 0+10 digits• Other <p>The default is all values selected (in other words, allow any dial pattern).</p>

Parameter	Access	Description
Attribute value – ANI II digits	Change	<p>This field appears only if Attribute type is set to ANI II digits. II digits associated with North American ANI functionality. This is normally a property of a subscriber line but may be changed for some call types. This value is not checked or semantically interpreted, and you can configure any value within the range 00 to 99. The default is 0.</p> <p>For an incoming call over SIP or ISUP, this value is normally set by the originating exchange; for a call originating on the switch it is initially set by Call Services. Number Validation can override the initial value if required; the exception is that the initial value on an incoming call over SIP must be left unchanged.</p>

Parameter	Access	Description
Attribute value - ANI Screening lookup type	Change	<p>This field appears only if Attribute type is set to ANI Screening lookup. Specifies whether an ANI Screening lookup should be performed when processing this call, and if so how the lookup should be performed. If the MetaSwitch NE provides a long-distance service to subscribers using its own carrier code, ANI Screening lookup is used to check the calling number to ensure that the calling subscriber is permitted to use this service. Values:</p> <ul style="list-style-type: none">• None (default) No ANI Screening lookup.• Lookup on carrier code (North America only) Check that the Transit Network ID associated with the call matches the on-switch carrier configured for the active Config Set, and if so perform an ANI Screening lookup using the configured ANI Screening Table.• Lookup in specific table Use the ANI Screening Table specified in Attribute value - ANI Screening lookup table to perform the lookup (without checking the Transit Network ID).
Attribute value - ANI Screening lookup table	Change	<p>This field appears only if Attribute value - ANI Screening lookup type is visible and set to Lookup in specific table. Specifies the ANI Screening Table to be used for the ANI Screening lookup. If the specified number type is not available, the call is processed as if no match could be found. Click on the ellipsis symbol at the end of the field to select from the configured ANI Screening Tables. (In the current version there can be only one ANI Screening Table.)</p>

Parameter	Access	Description
Attribute value – announcement ID	Change	<p>This field appears only if Attribute type is set to Announcement ID. The announcement ID is optional, and can be set on failure of routing or number validation to request playing of a specific announcement. You cannot set both an Announcement ID and a Customer Announcement ID in the same attribute set. If no announcement ID is specified, and the call cannot be released immediately, the default announcement associated with the error code will be played. After the announcement has been played, the caller will get dial tone or reorder based on the value of the Line treatment after call disconnect field on the Line Signaling object.</p> <p>Values:</p> <ul style="list-style-type: none">• None (default) No announcement is played and the caller immediately gets the treatment defined by the Line treatment after call disconnect field on the Line Signaling object.• Bad area code• Missing area code• Unnecessary area code• Unnecessary prefix• Number disconnected• Individual number changed• Bad CAC combination• Changed CAC• Wrong CAC• No intraLATA CAC• Bad CAC• No domestic CAC• No international CAC• Restricted CAC• Prohibited CAC• Prefix required• Group number changed• Media in use• Test tone

Parameter	Access	Description
		Depending on the Announcement ID value, you may need to set up additional Attribute Entry objects for parameters required by the announcement. See Announcement Parameters at the end of this section for more information.
Attribute value – announcement parameter 1	Change	This field appears only if Attribute type is set to Announcement Parameter 1 . Numeric string for the first parameter to be included in the error announcement. This attribute is valid only in an Attribute Set that includes the Announcement ID or Customer Announcement ID attribute. Specify a string of up to 32 digits. Only ASCII digits 0 – 9 are valid.
Attribute value – announcement parameter 2	Change	This field appears only if Attribute type is set to Announcement Parameter 2 . Numeric string for the second parameter to be included in the error announcement. This attribute is valid only in an Attribute Set that includes the Announcement ID or Customer Announcement ID attribute. Specify a string of up to 32 digits. Only ASCII digits 0 – 9 are valid.
Attribute value – area code dialed	Change	This field appears only if Attribute type is set to Area code dialed . Attribute used at an originating exchange to indicate whether the calling subscriber dialed an area code as part of the called number. This is subsequently used by billing and MF. Values: <ul style="list-style-type: none">• Unknown (default)• Not applicable• Not dialed• Dialed

Parameter	Access	Description
Attribute value - Authorization Code Operation	Change	<p>This field appears only if Attribute type is set to Authorization Code Service. Specifies whether this call requires an authorization code, and if so how the valid code is determined. Values:</p> <ul style="list-style-type: none"> • None (default) No authorization code is required. • No Validation The authorization code specified in Attribute value - Authorization Code Prefix is used only in billing records for the call. The subscriber is not required to dial an authorization code to make the call. • On-Switch Calling Card / Hotline The subscriber must dial an authorization code (and optionally an associated PIN) to make the call, and the following fields define how this code is validated.
Attribute value - Authorization Code Table	Change	<p>This field appears only if Attribute value - Authorization Code Operation is visible and set to On-Switch Calling Card / Hotline. Specifies the authorization code table that is used to check the authorization code supplied for the call. Click on the ellipsis symbol at the end of the field to select from the configured Authorization Code Tables. If you change this value and Attribute value - Valid Authorization Codes is set to Specific code, you must specify a new value in the Attribute value - Authorization Code field.</p>

Parameter	Access	Description
Attribute value - Valid Authorization Codes	Change	<p>This field appears only if Attribute value - Authorization Code Operation is visible and set to On-Switch Calling Card / Hotline. Specifies whether this call requires a specific authorization code or any code from the specified table.</p> <p>Values:</p> <ul style="list-style-type: none">• Any code in table (default) The subscriber can use any authorization code in the table specified by Attribute value - Authorization Code Table.• Specific code (default) The subscriber must use the authorization code specified in Attribute value - Authorization Code.
Attribute value - Authorization Code	Change	<p>This field appears only if Attribute value - Valid Authorization Codes is visible and set to Specific code. In particular, note that it is not used for non-validated codes; the Attribute value - Authorization Code Prefix field is used to specify these.</p> <p>Specifies the authorization code that must be supplied for the call. Click on the ellipsis symbol at the end of the field to select from the Authorization Codes in the specified table, or type in the code value (which must be of the length defined in the specified table).</p> <p>If you change the value of Attribute value - Authorization Code Table, you must specify a new value for this field.</p>

Parameter	Access	Description
Attribute value - Authorization Code Prefix	Change	<p>This field appears only if Attribute type is set to Authorization Code Service. The use of this field depends on the setting of Attribute value - Authorization Code Operation, as follows.</p> <ul style="list-style-type: none">• If Authorization Code Operation is None, this field does not appear.• If Authorization Code Operation is No Validation, this field contains the complete authorization code that should be added to billing records for the call.• If Authorization Code Operation is On-Switch Calling Card / Hotline, this field defines an optional prefix for the authorization code. The complete code that is checked against authorization code tables consists of this prefix followed by the code dialed by the subscriber. For example, if the authorization code is the subscriber's home directory number (validated by a PIN), this field could contain the NPA code so that the subscriber need only enter the 7D number.

Parameter	Access	Description
Attribute value - billing - call type	Change	<p>This field appears only if Attribute type is set to Billing - call type. If you need to override the call type in the first billing record for this call, set this attribute in Number Validation to specify the call type to be used. Values:</p> <ul style="list-style-type: none"> • 1 • 5 • 6 • 9 • 33 • 45 • 47 • 88 • 110 • 119 • 131 • 132 • 134 • 141 • 142 • 710 • 711 • 720 • 721 • 800 - 999 <p>This range of values is reserved for your own custom billing records; you can use any value in this range.</p> <p>See Call Type / Structure Code Combinations at the end of this section for the valid combinations of call type and structure code.</p> <p>If the call would not normally generate any billing records, a billing record is created only if you specify both the structure code and the call type.</p> <p>Otherwise the selected call type replaces the call type in the first billing record for the call.</p>

Parameter	Access	Description
Attribute value - billing - override AIN billing	Change	<p>This field appears only if Attribute type is set to Billing - override AIN billing. Specifies whether the values in Attribute value - billing - structure code and Attribute value - billing - call type should override the billing record produced for AIN calls as well as for standard calls. This field is ignored for non-AIN calls. Values:</p> <ul style="list-style-type: none"> • Yes If a structure code is specified, it is used in the AIN billing record; the call type is also used in this record if it is specified. If the structure code is not specified, any specified call type is ignored. • No (default) The specified structure code and call type are ignored for AIN calls, and are used to override the NE's standard billing records only for non-AIN calls.

Parameter	Access	Description
Attribute value - billing - structure code	Change	<p>This field appears only if Attribute type is set to Billing - structure code. If you need to override the structure code in the first billing record for this call, specify the structure code to be used. Values:</p> <ul style="list-style-type: none"> • 1 • 20 • 28 • 79 • 220 • 221 • 360 • 364 • 500 • 625 • 653 <p>See Call Type / Structure Code Combinations at the end of this section for the valid combinations of call type and structure code.</p> <p>If the call would not normally generate any billing records, a billing record is created only if you specify both the structure code and the call type. Otherwise the selected structure code replaces the structure code in the first billing record for the call.</p>
Attribute value – called address complete	Read only	<p>This field appears only if Attribute type is set to Called address complete. In this case, the only valid value is Yes, so this is a read-only field and you cannot specify a value.</p> <p>For calls originating on the switch, line signaling sets the Called address complete attribute to Yes if a digit map match cannot be found or occurred only on timer expiry.</p> <p>Number validation sets the Called address complete attribute to Yes if it knows a number is complete (which is normally always the case unless overlap addressing is being used).</p>

Parameter	Access	Description
Attribute value – called address scope	Change	<p>This field appears only if Attribute type is set to Called address scope. Area within which the called address is unique.</p> <ul style="list-style-type: none">• For dialed digit addresses, the address scope is unknown on input and must be converted to a different value before successful completion of number validation.• For E.164 addresses, the scope is not normally changed during number validation except in the case where number validation adds an area code to the number when the address scope may be updated to reflect this. <p>Values:</p> <ul style="list-style-type: none">• Unknown (default)• International• National• Subscriber• No number• UK specific
Attribute value – called address type	Change	<p>This field appears only if Attribute type is set to Called address type. Address type of the called address. Number validation uses this to determine which number validation table to use initially, and normally converts "dialed digits" addresses into E164 addresses.</p> <p>Values:</p> <ul style="list-style-type: none">• E.164 (default)• Dialed digits
Attribute value – call hold allowed	Change	<p>This field appears only if Attribute type is set to Call hold allowed. Indicates whether holding this call is allowed. At a call originating exchange, call holding is normally allowed, but may be disallowed during number validation processing (typically when the call is routed to a carrier with whom there is no agreement to support call hold for operator calls). Values:</p> <ul style="list-style-type: none">• No (default)• Yes

Parameter	Access	Description
Attribute value - calling category	Change	<p>This field appears only if Attribute type is set to Calling category. The category of call being placed by the calling party. The output value of this attribute is used in the Calling Party Category field in an ISUP IAM. Values:</p> <ul style="list-style-type: none">• Normal (default)• Emergency
Attribute value – call type	Change	<p>This field appears only if Attribute type is set to Call type. Type of the call being established. This is set by the number validation component at the call originating exchange to indicate the type of the call, and is used for Billing and Call Barring. Values:</p> <ul style="list-style-type: none">• Unknown (default)• Operator• Emergency• Local• IntraLATA• InterLATA national• InterLATA international• Toll free• Premium• Other non-geographic• Operator Service• Directory Assist• FGD cut through• FGB• International• International toll free• Other N11• Other <p>The default value Unknown can be used as a placeholder value during number validation, but should be replaced by a more specific value before number validation completes. The call will not be routed if this attribute value is set when number validation completes.</p>

Parameter	Access	Description
Attribute value – carrier call type	Change	<p>This field appears only if Attribute type is set to Carrier call type. Carrier call type for this call. This attribute can only be set up in the main validation tables, not in the Carrier table, and is used internally within Number Validation to check that a carrier supports calls of a particular type. Values:</p> <ul style="list-style-type: none">• International - not world zone 1 (default)• International - world zone 1• InterLATA• IntraLATA• InterLATA CDR
Attribute value – carrier type	Change	<p>This field appears only if Attribute type is set to Carrier type. FGD carrier type selected by number validation for this call. Values:</p> <ul style="list-style-type: none">• Unknown (default)• LEC• IC• International• InterLATA and international
Attribute value – country code length	Change	<p>This field appears only if Attribute type is set to Country code length. Length of the country code for an international call. It may be used by signaling stacks in order to extract the country code prefix from the called number. This attribute is used only at an originating exchange. Non-zero values are used only for international calls. (In North America, it is set only for non-world zone 1 international calls which cannot be dialed using a standard NPA). Range: 0 - 3. The default is 0.</p>

Parameter	Access	Description
Attribute value – customer announcement ID	Change	<p>This field appears only if Attribute type is set to Customer announcement ID. Identifies a customer-specific announcement that is to be played to the subscriber on Number Validation failure. You cannot set both a Customer Announcement ID and an Announcement ID in the same attribute set. You will need to set up an entry in the customer-specific message catalog to include the appropriate announcement; see the <i>Integration and Customization Manual</i> for more information about customizing announcements. Set this field to specify the message number for the appropriate announcement in the customized message catalog file. Each customer announcement may take up to two parameters, as specified by Announcement Parameter 1 and Announcement Parameter 2. If no Announcement ID or Customer Announcement ID is specified, and the call cannot be released immediately, the default announcement associated with the error code is played.</p>
Attribute value – dialed prefix	Change	<p>This field appears only if Attribute type is set to Dialed prefix. Identifies the US prefix digits used when dialing a call. In particular, this parameter distinguishes between 1/011 dialed calls and 0/01 dialed calls. This attribute is only ever set by number validation at an originating exchange. Values:</p> <ul style="list-style-type: none">• Unknown (default)• 1+• 0+• 0–• None

Parameter	Access	Description
Attribute value – dialing pattern	Change	<p>This field appears only if Attribute type is set to Dialing pattern. Indicates the dialing pattern used for the dialed number. This attribute is used internally during number validation to check that a number has been dialed correctly. Values:</p> <ul style="list-style-type: none">• 7 digits (default)• 10 digits• 1+10 digits• 0+10 digits• Other
Attribute value - echo cancellation	Change	<p>This field is visible only if Attribute type is set to Echo cancellation. Echo cancellation requirements for this call. This is normally configured in number validation, determined by analysis of the called address. For example, international calls often meet sufficient delay to require echo cancellation. Echo cancellation can also be set up for each media channel in MF and ISUP Signaling. This is normally required if the media channel is known to have a long delay, for example if it represents a satellite link. Values:</p> <ul style="list-style-type: none">• Required (default)• Preferred
Attribute value – FGD carrier dialing allowed	Change	<p>This field appears only if Attribute type is set to FGD carrier dialing allowed. Indicates whether dialing of an FGD carrier prefix is allowed for this call. For some calls where FGD carrier dialing is inappropriate, it is tolerated (for example 911 calls), whereas for others it is disallowed. Values:</p> <ul style="list-style-type: none">• No (default)• Yes

Parameter	Access	Description
Attribute value – FGD carrier ID	Change	<p>This field appears only if Attribute type is set to FGD carrier ID. Carrier ID associated with the call. This is normally the carrier ID to which the call should be routed (although this field is never used for routing). The exception is operator calls where the operator service for a given carrier may be provided by a different carrier. Enter the carrier ID as 4 decimal digits. The default is zero.</p>
Attribute value – FGD carrier requirement	Change	<p>This field appears only if Attribute type is set to FGD carrier requirement. Indicates whether a carrier is required for a particular call, and if so the type of carrier that is to be used. This attribute is used when determining the carrier information to use for a call at the end of number validation processing. Values:</p> <ul style="list-style-type: none">• None required (default) No carrier is required for this call, so carrier selection will not be performed.• Use dialed or PIC1 Use the carrier ID dialed by the subscriber, or the subscriber's default long distance carrier ID (PIC1).• Use dialed or PIC2 Use the carrier ID dialed by the subscriber, or the subscriber's default intraLATA carrier ID (PIC2).• Use dialed or PIC3 Use the carrier ID dialed by the subscriber, or the subscriber's default international carrier ID (PIC3).• Use specified Use the value specified by the FGD carrier ID attribute; this attribute must be specified within the same Attribute Set.

Parameter	Access	Description
Attribute value – force LNP lookup	Change	<p>This field appears only if Attribute type is set to Force LNP lookup. Specifies whether to force an LNP lookup for this call even though the destination number is on the switch. This may be required if the NE supports subscribers in multiple local areas; in some cases there is a regulatory requirement to route calls between different areas using an external carrier even though both subscribers are on the same NE, and the carrier may require an LNP lookup to be performed before it accepts the call. Values:</p> <ul style="list-style-type: none">• Yes• No (default)

Parameter	Access	Description
Attribute value - force on-switch lookup	Change	<p>This field appears only if Attribute type is set to Force on-switch lookup. Specifies whether the NE should always look up the called address in the database of subscribers on this switch, and allow routing to the associated subscriber if found. This overrides the default behavior for some calls, avoiding the use of a long-distance carrier when both subscribers are on the same NE. For example, if a call is classed as an InterLATA or IntraLATA call it would normally be routed to an IXC even if the calling and called parties are co-located on the same switch.</p> <p>Forcing on-switch lookup suppresses billing records for the call; if you want to ensure that these records are created, set the Billing - call type and Billing - structure code attributes in the same Attribute Set. Typical call type / structure code combinations are 6 / 1 for intraLATA calls and 110 / 625 for intraLATA calls; see Call Type / Structure Code Combinations at the end of this section for the valid combinations of call type and structure code.</p> <p>Note that setting this attribute is against equal access regulations in some circumstances, but in others, notably in VoIP networks, the regulations are more relaxed. Values:</p> <ul style="list-style-type: none">• Yes• No

Parameter	Access	Description
Attribute value - IN query ANI 1st preference	Change	<p>This field appears only if Attribute type is set to IN query ANI 1st preference. Specifies the preferred method for determining the ANI used in non-geographic number (toll-free) lookups for an adjacent switch. Depending on the trunk type over which the call is received, the adjacent switch may provide a partial ANI or no ANI; this attribute determines whether the ANI used for the lookup should be taken from the received ANI if available, from configured values on the MetaSwitch NE, or from some combination of the two. If the ANI information indicated by this attribute is not available, the following attributes 2nd preference and 3rd preference are used instead. Values:</p> <ul style="list-style-type: none">• Standard ANI (default) Use the full ANI information received on the call.• Provided 7-digit ANI with configured NPA Use the 7-digit ANI information received on the call, with the NPA value configured in Attribute value - IN query ANI NPA.• Source address NPA-NXX Use the first 6 digits of the received source address.• Configured NPA-NXX Use the NPA-NXX value configured in Attribute value - IN query ANI NPA-NXX.
Attribute value - IN query ANI 2nd preference	Change	<p>This field appears only if Attribute type is set to IN query ANI 2nd preference. Specifies an alternative method for determining the ANI used in non-geographic number (toll-free) lookups for an adjacent switch if the ANI information indicated by the 1st preference attribute is not available. The valid values are the same as for the Attribute value - IN query ANI 1st preference attribute.</p>

Parameter	Access	Description
Attribute value - IN query ANI 3rd preference	Change	This field appears only if Attribute type is set to IN query ANI 3rd preference . Specifies an alternative method for determining the ANI used in non-geographic number (toll-free) lookups for an adjacent switch if the ANI information indicated by the 1st preference and 2nd preference attributes is not available. The valid values are the same as for the Attribute value - IN query ANI 1st preference attribute.
Attribute value - IN query ANI NPA	Change	NPA value to be used in non-geographic number (toll-free) lookups for an adjacent switch if the NPA is not provided in AIN information for the call. Specify a value in the range 0 - 999. If the parent Attribute Set contains an Attribute Entry for one of the IN query ANI 1st - 3rd preference attributes indicating that the MetaSwitch NE should use a configured ANI NPA value, it must also contain an Attribute Entry for this attribute specifying the required NPA value.
Attribute value - IN query ANI NPA-NXX	Change	NPA-NXX value to be used in non-geographic number (toll-free) lookups for an adjacent switch if the NPA-NXX is not provided in AIN information for the call. Specify a value in the range 0 - 999999. If the parent Attribute Set contains an Attribute Entry for one of the IN query ANI 1st - 3rd preference attributes indicating that the MetaSwitch NE should use a configured ANI NPA-NXX value, it must also contain an Attribute Entry for this attribute specifying the required NPA-NXX value.

Parameter	Access	Description
Attribute value – IN trigger index	Change	<p>This field appears only if Attribute type is set to IN trigger index.</p> <p>An Intelligent Networking trigger that will be deemed to have been hit if this attribute is set. When this attribute is present, the IN US trigger match type attribute must also be present. The attribute set containing this attribute may only be referred to from a number validation entry with an action (default or explicit) of Complete Validation. Select from the displayed list of IN Triggers.</p>
Attribute value – IN US trigger match type	Change	<p>This field appears only if Attribute type is set to IN US trigger match type.</p> <p>Type of Intelligent Networking trigger match. This attribute should be set based on the length of matching performed on the destination number when the attribute set containing this attribute is picked up. When this attribute is present, the IN trigger index attribute must also be present. Values:</p> <ul style="list-style-type: none">• NPA (default)• NPA XXX• NPA XXX XXXX

Parameter	Access	Description
Attribute value – ISUP called address prefix	Change	<p>This field appears only if Attribute type is set to ISUP called address prefix; it is used only for long-distance calls in Canada that are routed over ISUP trunks, and is not required for deployments elsewhere. Specifies a 4-character prefix (also known as an NXZZ code) to be added to the called number in the ISUP IAM message. These prefixes are not used for calls over non-ISUP trunks. This is a 4-character string in which the first character is a letter A - F and the remaining characters are letters A-F or numbers 0 - 9. Leaving this field blank indicates that no prefix is to be included. In most cases the string is of the form DNNN, where <i>NNN</i> is a 3-digit number; typical values are D081 for 1+10D dialed long distance calls, D138 for direct dialed international calls, and D022 for 1-600-XXX-XXXX calls.</p> <ul style="list-style-type: none">• For calls originating on the switch that will be routed over ISUP trunks, you can set the appropriate value in Number Validation.• For tandem calls, the received prefix is stored as an attribute of the call so that it can be re-used on the outgoing leg of the call. You may need to change or remove this attribute in Number Validation (in the same way as for calls originating on the switch), particularly if the called number changes during processing of the call. In particular, if the called number is changed by a Call Service, such as call forwarding, the received prefix is removed, so you will need to assign a new prefix in Number Validation (after the called number is changed) if a prefix is required. Note that an exception to this is Local Number Portability processing, which always leaves the prefix unchanged.

Parameter	Access	Description
Attribute value – maximum call duration	Change	<p>This field appears only if Attribute type is set to Maximum call duration. Maximum permitted duration for a call. If this attribute (MCD) is set, the call will be terminated if it is still in progress when the specified limit is reached. This is typically used to prevent excessive call charges arising from calls to expensive destinations (for example long-distance or international calls).</p> <p>The MCD attribute can be set in either Number Validation or Routing, and the duration is measured from the time when Number Validation or Routing completes with the MCD attribute set. This means that, if the specified duration is too short, the call may be terminated before it has been answered or before an announcement being played to it has completed.</p> <p>A multi-party call can have the MCD attribute set on some branches of the call but not on others. If all MCD-controlled branches of the call end before the specified duration is reached, any remaining call branches are not affected by the MCD. However, if the MCD is reached on one branch of the call, all branches of the call are terminated at the same time, including those that do not have an MCD set.</p> <p>The MCD attribute is ignored if any part of the call is identified as an emergency call; these calls will not be terminated when the MCD expires.</p> <p>Specify the duration in minutes, in the range 1 - 1440 (1 minute - 24 hours), or specify zero to indicate no limit.</p>

Parameter	Access	Description
Attribute value – message billing index	Change	This field appears only if Attribute type is set to Message Billing Index . Message Billing Index associated with the call. If this index is included, a billing record containing the MBI is recorded in billing files. You should normally include an MBI for a call from a subscriber whose billing type is FX rate ; it is optional for other subscriber types. Enter the index as 3 decimal digits.
Attribute value - number type for ANI lookup	Change	This field appears only if Attribute type is set to Number type for ANI lookup . Specifies the type of number associated with the call (charge number or calling party number) that should be looked up in an ANI Screening lookup. If this number is not available, the call is processed as if no match could be found. Values: <ul style="list-style-type: none"> • Charge number Use the Charge Number for lookup. • Charge number preferred Use the Charge Number for lookup if it is available; use the Calling Party Number if this is the only number available. • Calling party number Use the Calling Party Number for lookup. • Calling party number preferred Use the Calling Party Number for lookup if it is available; use the Charge Number if this is the only number available.

Parameter	Access	Description
Attribute value – operator call	Change	<p>This field appears only if Attribute type is set to Operator call. Indicates whether some kind of operator involvement is required for this call. This is set by the number validation component at an originating exchange for direct calls to an operator, calls which require operator involvement and operator services calls. Currently this indicator is ignored at a non-originating exchange.</p> <p>Values:</p> <ul style="list-style-type: none">• No (default)• Yes
Attribute value – outgoing ISUP/ISDN release cause	Change	<p>This field appears only if Attribute type is set to Outgoing ISUP/ISDN Release Cause. Indicates whether a specific release cause is to be reported to the originating switch if the call could not be routed on this switch, or if it was routed to another switch and was rejected there. The release cause will be reported only if the call was received over an ISUP or ISDN trunk.</p> <p>Note that setting a release cause does not in itself cause the call to be rejected. The valid values for this attribute are a subset of those defined in Q.850; the other values defined in Q.850 are not supported, generally because they do not apply to ISUP and ISDN trunks. See Outgoing Release Causes at the end of this section for a full list of values and some restrictions on their use.</p> <p>Alternatively, you can specify Auto (the default) to indicate that the NE should use the release cause that it determined, or the release cause signaled by the terminating switch if the call was routed to another switch and was rejected there.</p>

Parameter	Access	Description
Attribute value - permit when service suspended	Change	<p>This field appears only if Attribute type is set to Permit when service suspended.</p> <p>Specifies whether the NE should allow calls to this number even when the subscriber's telephone service is suspended. In general, a suspended subscriber can make calls to the emergency service number 911 and to one other number defined in the General Call Service Controls object. If you need to allow access to other numbers, set this attribute during number validation on all numbers for which access is required.</p> <p>Values:</p> <ul style="list-style-type: none">• Yes• No
Attribute value – priority call	Change	<p>This field appears only if Attribute type is set to Priority call.</p> <p>Indicates whether the call requires priority handling. At an originating exchange, this defaults to No but can be set by number validation processing if required. Whether or not a call is a priority call may affect how it is routed.</p> <p>Values:</p> <ul style="list-style-type: none">• No (default)• Yes

Parameter	Access	Description
Attribute value - pseudo ANI egress signaling types	Change	<p>This field appears only if Attribute type is set to Pseudo ANI egress signaling types.</p> <p>Specifies the types of outgoing signaling stack for which Pseudo ANI is to be used. This attribute, set in Number Validation, allows you to restrict the use of Pseudo ANI so that it is used on some signaling types but not on others.</p> <p>This attribute applies only if the attribute Use Pseudo ANI (pANI) is also set. By default, if Use Pseudo ANI is set but this attribute is not set, Pseudo ANI is used on all signaling stack types. Values:</p> <ul style="list-style-type: none">• ISUP• ISDN access• ISDN trunk• SIP access• SIP trunk• Analog
Attribute value - pseudo ANI presentation indicator	Change	<p>This field appears only if Attribute type is set to Pseudo ANI presentation indicator. Specifies the presentation indicator to be used with Pseudo ANI, which controls whether the Pseudo ANI calling number can be presented to the called user. This attribute applies only if the attribute Use Pseudo ANI (pANI) is also set. Values:</p> <ul style="list-style-type: none">• Restricted (default)• Available
Attribute value – region code	Change	<p>This field appears only if Attribute type is set to Region code.</p> <p>Identifies the region associated with an international world zone 1 call. This is used by MF signaling.</p> <p>Range : 0 – 9. The default is 0.</p>
Attribute value – release control mode	Change	<p>This attribute is not valid in North America.</p>

Parameter	Access	Description
Attribute value – restricted line 950 call	Change	This field appears only if Attribute type is set to Restricted line 950 call . Indicates whether the call is to a 950-XXXX number from a restricted (hotel/motel) line. Values: <ul style="list-style-type: none">• No (default)• Yes
Attribute value – routing control	Change	This attribute is not valid in North America.
Attribute value – signal access signaling for operator call	Change	This field appears only if Attribute type is set to Signal access signaling for operator call . Indicates whether the access signaling type should be signaled by ISUP for operator calls when using the “modified nature of address” encoding as specified in GR-1277. This attribute can be set only at a call originating exchange and is ignored for non operator calls. Values: <ul style="list-style-type: none">• No (default)• Yes
Attribute value – signal FGD carrier ID	Change	This field appears only if Attribute type is set to Signaling FGD carrier ID . Indicates whether the FGD carrier ID parameter should be signaled to the called party. This parameter is used only if the call is routed to an ISUP media channel. Values: <ul style="list-style-type: none">• No (default)• Yes
Attribute value - Signaling Gateway	Change	This field appears only if Attribute type is set to Signaling Gateway . Specifies the Signaling Gateway associated with this call. Select from the displayed list of configured Signaling Gateways.

Parameter	Access	Description
Attribute value – test call	Change	<p>This field appears only if Attribute type is set to Test call. Indicates whether the call is a test call. This is set by number validation based on the dialed number, and may be used in routing the call. Values:</p> <ul style="list-style-type: none">• No (default)• Yes
Attribute value – Transit Network ID	Change	<p>This field appears only if Attribute type is set to Transit Network ID. Identifier for the transit network to which the call should be routed. Number validation normally sets this to match the carrier ID associated with the call (if any). However, for some operator calls, the transit network is different from the carrier ID for the call because one carrier provides operator services for another. Routing will use this attribute, if present, as the primary routing key. Range: 0 - 9999. The default is 0.</p>
Attribute value – UK call type	Change	<p>This attribute is not valid in North America.</p>
Attribute value – use modified operator NOA encoding	Change	<p>This field appears only if Attribute type is set to Use modified operator NOA encoding. This parameter specifies whether ISUP should encode the IAM for an operator call according to the "basic" or "modified" Nature Of Address (NOA) rules as described in GR-1277. This parameter is used only if the call is routed to an ISUP media channel, and may be modified for each destination carrier. Values:</p> <ul style="list-style-type: none">• No (default) Use the basic NOA rules.• Yes Use the modified NOA rules.

Parameter	Access	Description
Attribute value – use operator requested NOA encoding	Change	<p>This field appears only if Attribute type is set to Use operator requested NOA encoding.</p> <p>This parameter specifies whether to use the "operator requested" Nature Of Address (NOA) variant when signaling an operator call. It is used only if the Use modified operator NOA encoding attribute is set to Yes and the call is routed to an ISUP media channel.</p> <p>Values:</p> <ul style="list-style-type: none">• No (default)• Yes
Attribute value – Use Pseudo ANI (pANI)	Change	<p>This field appears only if Attribute type is set to Use Pseudo ANI (pANI).</p> <p>Specifies whether the calling party fields in outgoing messages contain the Charge Number from the original call (instead of the Calling Party Number). This is used for interworking between different signaling stacks (for example if the incoming side of the call is over MF which does not support delivery of calling numbers), or when the ANI should be presented to the called party instead of the calling number (for example on calls to the emergency operator). Values:</p> <ul style="list-style-type: none">• Never Never use the charge number.• Only when no calling number Use the charge number only if there is no calling number (or a zero-length number) specified.• Always (default) Use the charge number as ANI regardless of whether there is a calling number specified. <p>Note that the NE's use of Pseudo ANI is also affected by the attributes Pseudo ANI egress signaling types and Pseudo ANI presentation indicator.</p>

Parameter	Access	Description
Attribute value - user defined	Change	<p>This field appears only if Attribute type is set to one of the User Defined Attribute values (UDA 1 - UDA 20) or to User defined MF call type.</p> <p>Specifies a user-defined numeric value that should be added to this routing request for use later in the routing process, or for selection of an MF outgoing call profile if the call is transported over MF signaling.</p> <p>User Defined Attributes are provided as an extension to allow you to perform routing that is specific to your deployment and cannot be controlled by other attributes; many deployments may not require them. They are configured using the User Defined Attribute objects. The MetaSwitch Class 4/5 Softswitch does not assign a specific meaning to any particular User Defined Attribute or its value; you can use any of these attributes and assign values as required. For each attribute, you can specify an optional name to identify the attribute's meaning. In Number Validation, you can specify a User Defined attribute as an integer value; you can then match on one or more of these values later in Number Validation or during Routing to determine how to route the call. The User Defined MF Call Type attribute applies only to calls routed over MF signaling.</p> <ul style="list-style-type: none">• In number validation and categorization for incoming MF calls, this attribute allows you to distinguish between incoming calls that are signaled differently, where the standard call attributes as set in the incoming profile are not sufficient to allow this. Other appropriate attributes can then be set in Number Validation as required.

Parameter	Access	Description
		<ul style="list-style-type: none">• For outgoing calls over MF, it allows selection of the appropriate outgoing call profile data entry (determining how the call is signaled to the peer) where the normal match fields are not sufficient. <p>In an MF Incoming Call Profile or in Number Validation, you can set this attribute to an integer value identifying the type of call; you can then match on this value later in an MF Outgoing Call Profile to determine how to signal the call. The MetaSwitch Class 4/5 Softswitch does not assign a specific meaning to any particular value for this attribute; you can assign values as required.</p> <p>If a call is processed by an SCP lookup from an Intelligent Networking Services Trigger and the called number is changed, any existing value for user defined attributes are removed; you will need to configure the INS Trigger to re-run Number Validation in order to reset the attributes if they are still required after the lookup.</p>

Parameter	Access	Description
Attribute value – US LATA	Change	<p>This field appears only if Attribute type is set to US LATA.</p> <p>The US LATA identifier, which specifies the Local Access and Transport Area associated with a calling or forwarding subscriber. LATA identifiers are defined in the US Local Exchange Routing Guide (LERG) published by Telcordia. This attribute is used only when performing AIN TCAP lookups; these lookups may succeed if the attribute is absent, but are liable to fail.</p> <p>If all subscribers are associated with a single LATA, this attribute should be set up in a default attribute set early in the NV tables. If subscribers in different subscriber groups are associated with different LATAs, this attribute should be set in an attribute set specific to the subscriber group.</p> <p>Range: 0 – 999. The default is 0. If the LATA code you want to use contains 5 digits, use the first 3 digits in this field.</p>
Requested status	Read only	<p>Specifies whether an administrator has attempted to enable the Attribute Entry. Values:</p> <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	<p>Specifies the current status of the Attribute Entry. Values:</p> <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

Announcement Parameters

Some announcements played to subscribers require one or more parameters that are inserted into the announcement; for example, an announcement informing the subscriber of an area code change requires a parameter specifying the new area code. Other announcements require no parameters (for example a “number disconnected” announcement). For more information about how parameters are included in announcements, see the *Integration and Customization Manual*.

If you have set up an Attribute Entry with **Attribute type** set to **Announcement ID**, and the specific announcement ID you have selected requires one or two parameters, any Attribute Set that includes this Attribute Entry must also include one or two additional Attribute Entries for these parameters. In these entries, **Attribute type** must be set to **Announcement parameter 1** for the first parameter, and **Announcement parameter 2** for the second.

In the delivered system, the announcement IDs requiring parameters are as follows. Note that the requirement for parameters with specific announcement IDs may be different if you have customized the announcements as described in the *Integration and Customization Manual*.

No announcement parameters:

- Number disconnected
- Individual number changed
- Bad CAC combination
- No intraLATA CAC
- Bad CAC
- No domestic CAC
- No international CAC
- Restricted CAC
- Media in use
- Test tone
- Prohibited CAC

One announcement parameter:

- Bad area code
- Missing area code
- Unnecessary area code
- Unnecessary prefix
- Changed CAC
- Wrong CAC
- Prefix required

Two announcement parameters:

- Group number changed

Call Type / Structure Code Combinations

The parameters **Attribute value - billing - call type** and **Attribute value - billing - structure code** allow you to override the contents of the billing records generated by the MetaSwitch NE. You are recommended to use combinations of call type and structure code shown in the list below; the MetaSwitch NE supports other combinations of the valid values, but these do not correspond to standard billing records and you will need to ensure that your billing systems can deal with them.

For more information about the format of billing records that the MetaSwitch NE generates, see *Operations Manual: Billing*.

Call type	Description	Supported structure codes
1	Detailed Message Rate, with MBI	20
5	Detailed Message Rate, no MBI	1, 220, 500
6	Station paid (InterLATA)	1, 500
9	411 DA	28
33	555 DA	28
45	ISDN User Service	0001, 0220, 0221, 0500
47	Default AIN	221
88	555 non-DA	1, 500
110	InterLATA Station Paid	625
119	Terminating Access Record	625, 653
131	FGA - Originating	79
132	FGA - Terminating	1, 500
134	FGB - Originating	625
141	Interexchange Carrier Number Services	360
142	Local Exchange Carrier Number Services	364
710	Originating Toll AMA Recording	625

Call type	Description	Supported structure codes
711	Terminating Toll AMA Recording	625
720	Connecting Network Access Incoming	625
721	Default LNP	1, 500
800 - 999	LEC defined	Any

Outgoing Release Causes

When an incoming call attempt received over an ISUP or ISDN trunk is to be rejected because it cannot be routed, you can specify a release cause as an attribute to be signaled to the originating switch, which may help that switch to determine how to re-route the call.

The MetaSwitch NE supports the release cause values listed below, which are defined in the Q.850 specification. However, you should note the following restrictions.

- Some of the supported release cause values are not valid over ISUP or ISDN, so the MetaSwitch NE automatically maps them to the nearest valid values for signaling to the originating switch. This is indicated by a new release cause code value under **ISUP mapping** or **ISDN mapping** in the table. If this column indicates **Unchanged**, the release cause value is passed through unchanged. In some cases, the ISUP mapping depends on the ISUP variant in use, as specified on the ISUP Local Signaling Destination that received the incoming call attempt; one mapping is used if the ISUP variant is **ANSI 1999**, and another mapping is used for all other variants.
- The Q.850 specification indicates that additional information should be signaled with some of the supported release cause values, but the MetaSwitch NE does not support signaling this additional information. This is indicated under **Extra info?** in the table. If this column indicates **Yes**, you should ensure that the originating switch can handle the specified release cause without the additional information; otherwise using this release cause may result in alarm conditions or error logs at the originating switch.
- For ISDN, the release cause code 19 (User not answering) is suppressed (this is in line with the ISDN specification). If you specify this release cause code when rejecting an incoming call from an ISDN trunk, the ISDN release message is not sent.

Value	Description	ISUP mapping	ISDN mapping	Extra info?
1	Unallocated number	Unchanged	Unchanged	Yes
2	No route to specified transit network (national use)	Unchanged	Unchanged	Yes
3	No route to destination	Unchanged	Unchanged	Yes
4	Send special info tone	Unchanged	41	No
5	Misdialed trunk prefix	31 (ANSI), Unchanged (other variants)	28	No
6	Channel unacceptable	31	Unchanged	No
7	Call awarded to established channel	31	Unchanged	No
8	Call pre-empted	Unchanged	41	No
9	Call pre-empted, circuit reserved	Unchanged	17	No
16	Normal call clearing	Unchanged	Unchanged	Yes
17	User busy	Unchanged	Unchanged	Yes
18	User not responding	Unchanged	Unchanged	No
19	User not answering	Unchanged	Unchanged	No
20	Subscriber absent	Unchanged	19	No
21	Call rejected	Unchanged	Unchanged	Yes
22	Number changed	Unchanged	1	Yes
27	Destination out of order	Unchanged	Unchanged	No
28	Invalid number format	Unchanged	Unchanged	No
29	Facilities rejected	Unchanged	41	Yes

Value	Description	ISUP mapping	ISDN mapping	Extra info?
30	Response to status inquiry	31	Unchanged	No
31	Normal, unspecified	Unchanged	27	No
34	No circuit / channel available	Unchanged	Unchanged	No
38	Network out of order	Unchanged	41	No
41	Temporary failure	Unchanged	Unchanged	No
42	Switching equipment congestion	Unchanged	Unchanged	No
43	Access information discarded	Unchanged	Unchanged	Yes
44	Requested circuit / channel not available	Unchanged	Unchanged	No
46	Precedence call blocked	Unchanged	41	No
47	Resource unavailable, unspecified	Unchanged	41	No
50	Requested facility not subscribed	Unchanged	41	Yes
53	Outgoing calls barred within CUG	63 (ANSI), Unchanged (other variants)	41	No
55	Incoming calls barred within CUG	63 (ANSI), Unchanged (other variants)	41	No
57	Bearer capability not authorized	Unchanged	Unchanged	Yes
58	Bearer capability not presently available	Unchanged	34	Yes
62	Inconsistency in outgoing information element	Unchanged	41	No

Value	Description	ISUP mapping	ISDN mapping	Extra info?
63	Service or option not available, unspecified	Unchanged	41	No
65	Bearer capability not implemented	Unchanged (ANSI), 79 (other variants)	Unchanged	Yes
66	Channel type not implemented	79	41	Yes
69	Requested facility not implemented	Unchanged	65	Yes
70	Only restricted digital information bearer capability is available (national use)	Unchanged	41	No
79	Service option not implemented, unspecified	Unchanged	41	No
87	User is not a member of CUG	95 (ANSI), Unchanged (other variants)	41	No
88	Incompatible destination	Unchanged	Unchanged	No (ISUP), Yes (ISDN)
90	Non existent CUG	95 (ANSI), Unchanged (other variants)	41	No
91	Invalid transit network selection (national use)	Unchanged	41	No
95	Invalid message, unspecified	Unchanged	41	No
97	Message type non-existent or not implemented	Unchanged	41	Yes

Value	Description	ISUP mapping	ISDN mapping	Extra info?
98	Message not compatible with call state	Unchanged	41	Yes
99	Information element / parameter non-existent or not implemented	Unchanged (ANSI), 111 (other variants)	41	No (ISUP), Yes (ISDN)
102	Recovery on timer expiry	Unchanged	Unchanged	Yes
103	Parameter non-existent or not implemented - passed on (national use)	Unchanged	41	Yes
110	Unrecognized parameter discarded	Unchanged	41	Yes
111	Protocol error, unspecified	Unchanged	41	No
127	Interworking, unspecified	Unchanged	Unchanged	No

3.1.15 Number Validation Tables


Each Number Validation Table (described in section 3.1.16, **Number Validation Table**) defines the attributes of a routing request that should be matched against the Number Validation Entries within the table, and specifies how the closest match should be decided. Because there may be a large number of these objects, the EMS System Explorer groups them all under a single Number Validation Tables object. This grouping allows you to hide the individual Number Validation Table objects in the Tree View panel so that you can concentrate on other objects in the tree.

The Number Validation Tables object includes fields and pushbuttons for importing the configuration of its child Number Validation Table objects, as described in *Operations Manual: Overview*. Apart from these fields, you cannot configure or manage it. It exists simply as a way of grouping the individual Number Validation Table objects.

The Number Validation Tables object is a child of the Number Validation object.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✓ Import	✗ Export	✓ Output

To view details of individual Number Validation Tables, click on the  symbol next to the Number Validation Tables object. Click on the entry for an individual Number Validation Table to view its details.

To hide individual Number Validation Tables, click on the  symbol next to the Number Validation Tables object.

Parameter	Access	Description
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed

Parameter	Access	Description
Import – mode	Change	<p>Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values:</p> <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.</p>
Import – log correlator	Read only	<p>If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Import - correlator metaswitch	Read only	<p>If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

3.1.16 Number Validation Table

Each Number Validation Table object is a child of the Number Validation Tables object.

This object defines the attributes of a routing request that should be matched against the Number Validation Entries within the table, and specifies how the closest match should be decided. This table also defines a default next action and an Attribute Set that should be applied unless the matched entry specifies otherwise.



Note that when the parent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the parent Config Set before you can modify the object.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✓ Export	✓ Output

Parameter	Access	Description
Number Validation Table index	Create	Unique numerical index identifying the Number Validation Table. This field is optional; if you do not supply a value, the EMS assigns one.
Number Validation Table name	Change	Unique user-friendly name identifying the Number Validation Table. Specify a name of up to 64 characters. If a name is not specified, the EMS displays a default.
Search type	Change	Type of match to use on Number Validation Entry objects that are children of this object. Values: <ul style="list-style-type: none"> • Complete match (default) • Unique match • Prefix match

Parameter	Access	Description
Address match type	Change	<p>Specifies whether this table is used to process routing requests based on the destination address or source address.</p> <ul style="list-style-type: none">• For a call originating on the switch, the source address is the calling party's number, or (if the call has been forwarded by call forwarding on this NE) the number of the last party that forwarded the call.• For a call received over a trunk or from an application server, the source address is the calling party address as signaled by the peer equipment. <p>In almost all cases you will use destination address matching. Source matching may be required when dealing with incoming calls from problem carriers, as described in the Knowledge Base on the MetaSwitch Customer Portal (http://support.metaswitch.com); otherwise it should be used only in consultation with MetaSwitch support personnel. Values:</p> <ul style="list-style-type: none">• Destination (default)• Source
Match Attribute 1	Change	<p>Attribute of the routing request to match against Number Validation Entries in this Number Validation Table. Values:</p> <ul style="list-style-type: none">• None (default)• ANI II Digits (North America only)• ANI Screening Entry (North America only)• ANI Screening Lookup (North America only)• Bearer capability• Billing type (North America only)• Called address complete• Called address scope• CIP (North America only)• Dialed Prefix (North America only)• Dialing Pattern (North America only)• ESA Status (North America only)

Parameter	Access	Description
Match Attribute 2	Change	<ul style="list-style-type: none"> • FGD prefix dialed (North America only) • Incoming Media • Line Class Code 1 - Line Class Code 20 Each of the 20 Line Class Code options appears in this list only if you have configured a Line Class Code object with the corresponding numeric index value. It appears as LCC <i>n</i> - description (showing the index value in the range 1-20 and the configured description, if any). • Operator call • Originating Signaling Gateway • Subscriber Group • Transit Network ID (North America only) • UK Call Type • US Call Type • User Defined Attribute 1 - User Defined Attribute 20 Each of the 20 User Defined Attribute options appears in this list only if you have configured a User Defined Attribute object with the corresponding numeric index value. It appears as UDA <i>n</i> - description (showing the index value in the range 1-20 and the configured description, if any). • User Defined MF call type (North America only) • Subscriber NV and routing attributes <p>Second attribute of the routing request to match against Number Validation Entries in this Number Validation Table. Refer to the description of Match Attribute 1 for a full list of possible values. The default is None.</p>

Parameter	Access	Description
Match Attribute 3	Change	Third attribute of the routing request to match against Number Validation Entries in this Number Validation Table. Refer to the description of Match Attribute 1 for a full list of possible values. The default is None .
Default Routing Attribute Set	Change	Default Attribute Set to associate with this table. This value is used if the Routing Attribute Set field in the matched Number Validation Entry object is set to Default . Select from the displayed list of currently enabled Attribute Sets in the same Config Set as this Number Validation Table, or select None if no attributes are to be applied. As a short-cut to select the Attribute Set, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B* , a range such as CA-FL , an index value such as =3 , or an index range such as =1-20 . For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i> .

Parameter	Access	Description
Default next action	Change	<p>Default next action to be associated with this table. This value is used if the Next action field in the matched Number Validation Entry object is set to Use default. Values:</p> <ul style="list-style-type: none">• Complete validation (default) Complete number validation processing.• Look up After applying the number actions and updating any attributes, look up the number in another validation table (specified in the following field.)• Reject and announce Stop number validation processing and play the appropriate error announcement.• Store carrier ID and restart Store the supplied Carrier ID and restart number validation.• Store carrier ID and look up Store the supplied Carrier ID. Then, after applying the number actions and updating any attributes, look up the number in another validation table (specified in the following field.)• Handle as SAC Mark as a call to a service access code and finish routing.• Fail ANI screening (North America only) Reject the call with an announcement that the carrier code is not valid.

Parameter	Access	Description
Default next Number Validation Table	Change	<p>This field appears only if Default next action is set to Look up or Store carrier ID and look up. Select the next Number Validation Table to process.</p> <p>As a short-cut to select the Number Validation Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>
Export – number of objects exported	Read only	<p>The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.</p>
Export – status	Read only	<p>The status of the current or most recent export operation, if any. Values:</p> <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.

Parameter	Access	Description
Export – file	Change	The name of the text file (in the EMS User’s home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export – log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the ‘go to log’ button next to this field to jump to this message in the EMS log viewer window.
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.
Requested status	Read only	Specifies whether an administrator has attempted to enable the Number Validation Table. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of the Number Validation Table. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

3.1.17 Number Validation Entry

Each Number Validation Entry object is a child of a Number Validation Table object.

Each Number Validation Entry specifies a (wildcard) number and a series of attribute values against which the current routing request is matched. If the Number Validation Entry is determined to be the best match, other fields specify how the routing request should be manipulated and the next step in the number validation process.



Note that when the grandparent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the grandparent Config Set before you can modify the object.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✗ Export	✓ Output

Parameter	Access	Description
Number Validation Entry name	Change	Unique user-friendly name identifying the Number Validation Entry. Specify a name of up to 64 characters. If a name is not specified, the EMS displays a default.
Number	Change	String of explicit and wildcard digits expressing the form of a matching dialed number (or a matching calling number if the parent Number Validation Table has Address match type set to Source). Specify a string of up to 32 characters. Note that the . (period) character is not a valid wildcard character in this string; it is used only in digit maps.
Minimum match length	Change	Minimum number of digits in the dialed number (or calling number) that must be matched before this entry in the validation table can be matched. Note that a unique match within the table is always required. The default is 0. Range: 0 - 32

Parameter	Access	Description
Routing Attribute Set	Change	<p>Attribute Set specifying attributes to append to the routing request if this Number Validation Entry has been matched. Select from the displayed list of currently enabled Attribute Sets in the same Config Set as this Number Validation Entry. If you select Default, the value specified in the Default Routing Attribute Set field of the parent Number Validation Table is used.</p> <p>As a short-cut to select the Attribute Set, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>

Parameter	Access	Description
Next action	Change	<p>Action to be taken when this Number Validation Entry is matched. If you select Use default, the value specified in the Default match action field of the parent Number Validation Table is used.</p> <p>Values:</p> <ul style="list-style-type: none">• Use default (default)• Complete validation Complete number validation processing.• Look up After applying the number actions and updating any attributes, look up the number in another validation table (specified in the following field.)• Reject and announce Stop number validation processing and play the appropriate error announcement.• Store carrier ID and restart Store the supplied Carrier ID and restart number validation.• Store carrier ID and look up Store the supplied Carrier ID. Then, after applying the number actions and updating any attributes, look up the number in another validation table (specified in the following field.)• Handle as SAC Mark as a call to a service access code and finish routing.• Fail ANI screening (North America only) Reject the call with an announcement that the carrier code is not valid.

Parameter	Access	Description
Next Number Validation Table	Change	<p>This field appears only if Next action is set to Look up or Store carrier ID and look up. Specifies the next Number Validation Table to process; select from the displayed list.</p> <p>As a short-cut to select the Number Validation Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>
Use number for billing	Change	<p>Specifies whether the current number, as was used to matched this Number Validation Entry, should be used as the telephone number in billing records for this call (truncated or padded to 10 digits to suit the billing record format). This ensures that the call is billed to the current number, even if the number associated with the call is subsequently changed by a Number action (in either this Number Validation Entry or a later one) or by an AIN query. Values:</p> <ul style="list-style-type: none">• True• False (default)
Number action - called number action	Change	<p>This field appears only if the Address match type field in the parent Number Validation Table is set to Destination. A character string specifying the editing actions to be applied to the dialed number when this row is matched.</p> <p>The syntax of this string is described in Number Actions below. Specify a string of up to 32 characters.</p>

Parameter	Access	Description
Number action - calling party number action	Change	This field appears only if the Address match type field in the parent Number Validation Table is set to Source . A character string specifying the editing actions to be applied to the calling party number when this row is matched. The syntax of this string is described in Number Actions below. Specify a string of up to 32 characters.
Number action - charge number action	Change	This field appears only if the Address match type field in the parent Number Validation Table is set to Source . A character string specifying the editing actions to be applied to the charge number when this row is matched. The syntax of this string is described in Number Actions below. Specify a string of up to 32 characters.
Attribute value – billing type match	Change	This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Billing type . Specifies how to match on the billing type attribute. Values: <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – billing type	Change	This field appears only if Attribute value - billing type match is visible and set to Exact . Specifies the value of the billing type (determined from the originating subscriber's configuration) that matches this entry. Values: <ul style="list-style-type: none">• Flat rate (default)• Message rate• FX rate

Parameter	Access	Description
Attribute value – called address complete match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Called address complete.</p> <p>Specifies how to match on the called address complete attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – called address complete	Change	<p>This field appears only if Attribute value - called address complete match is visible and set to Exact.</p> <p>Specifies the value of the called address complete attribute that matches this entry. Values:</p> <ul style="list-style-type: none">• No• Yes (default)
Attribute value – called address scope match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Called address scope.</p> <p>Specifies how to match on the called address scope attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – called address scope	Change	<p>This field appears only if Attribute value - called address scope match is visible and set to Exact.</p> <p>Specifies the value of the called address scope attribute that matches this entry. Values:</p> <ul style="list-style-type: none">• Unknown (default)• International• National• Subscriber• No number• UK specific

Parameter	Access	Description
Attribute value – FGD prefix dialed match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to FGD prefix dialed.</p> <p>Specifies how to match on the FGD prefix dialed attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – FGD prefix dialed	Change	<p>This field appears only if Attribute value - FGD prefix dialed match is visible and set to Exact.</p> <p>Specifies the value of the FGD prefix dialed attribute (whether an FGD carrier ID has been prefixed to the number) that matches this entry. Values:</p> <ul style="list-style-type: none">• No (default)• Yes
Attribute value – operator call match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Operator call.</p> <p>Specifies how to match on the operator call attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – operator call	Change	<p>This field appears only if Attribute value - operator call match is visible and set to Exact.</p> <p>Specifies the value of the operator call attribute (whether or not the call should be treated as an operator call) that matches this entry. Values:</p> <ul style="list-style-type: none">• No (default)• Yes

Parameter	Access	Description
Attribute value – Subscriber Group match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Subscriber Group.</p> <p>Specifies how to match on the subscriber group attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – Subscriber Group	Change	<p>This field appears only if Attribute value - Subscriber Group match is visible and set to Exact.</p> <p>Specifies the value of the Subscriber Group attribute that matches this entry.</p> <ul style="list-style-type: none">• For calls originating on the switch, this indicates the Subscriber Group with which the calling party is associated.• For calls originating at a different exchange, no value is specified. <p>The value of this attribute determines which Digit Map is used, and may be involved in number validation and routing decisions.</p> <p>Select from the list of configured Subscriber Groups.</p>
Attribute value – CIP match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to CIP.</p> <p>Specifies how to match on the Carrier Identification Parameter (CIP) attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match even if not present (default)• Match any if present• Only match if absent

Parameter	Access	Description
Attribute value – CIP	Change	This field appears only if Attribute value - CIP match is visible and set to Exact . Specifies the value of the CIP attribute that matches this entry. Specify the CIP as a 4-digit number (with leading zeros if necessary).
Attribute value – Incoming Media - Signaling Stack match	Change	This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Incoming Media . Specifies how to match on the Incoming Media - Signaling Stack attribute. Values: <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – Incoming Media - Signaling Stack	Change	This field appears only if Attribute value - Incoming Media - Signaling Stack match is visible and set to Exact . Specifies the value of the Incoming Media - Signaling Stack attribute that matches this entry. Values: <ul style="list-style-type: none">• ISUP• MF• ISDN• SIP
Attribute value – Incoming Media - ISUP Local Signaling Destination	Change	This field appears only if Attribute value - Incoming Media - Signaling Stack is visible and set to ISUP . Specifies the value of the Incoming Media - ISUP Local Signaling Destination attribute that matches this entry. Select from the list of ISUP Local Signaling Destinations that are associated with a valid Signaling Gateway.

Parameter	Access	Description
Attribute value – Incoming Media - Adjacent Exchange match	Change	<p>This field appears only if Attribute value - Incoming Media - Signaling Stack match is visible and set to MF or ISUP.</p> <p>Specifies how to match on the Incoming Media - Adjacent Exchange attribute.</p> <p>Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – Incoming Media - Adjacent Exchange	Change	<p>This field appears only if Attribute value - Incoming Media - Adjacent Exchange match is visible and set to Exact.</p> <p>Specifies the value of the Incoming Media - Adjacent Exchange attribute that matches this entry. Select from the list of configured MF Remote Exchanges or ISUP Remote Signaling Destinations.</p>
Attribute value - Incoming Media - Media Channel match	Change	<p>This field appears only if Attribute value - Incoming Media - Signaling Stack is visible and set to ISDN or SIP, or if Attribute value - Incoming Media - Adjacent Exchange is visible.</p> <p>Specifies how to match on the Incoming Media - Media Channel attribute.</p> <p>Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value - Incoming Media - Media Channel	Change	<p>This field appears only if Attribute value - Incoming Media - Media Channel match is visible and set to Exact.</p> <p>Specifies the value of the Media Channel attribute that matches this entry. Select from the list of Media Channels configured for the selected ISUP Remote Signaling Destination, Media Channels configured for the selected MF Remote Exchange, ISDN trunk PRIs, or SIP Trunks (depending on the value of Attribute value - Incoming Media - Signaling Stack). Media channels and ISDN PRIs that support only outgoing calls cannot be used for matching on this attribute and do not appear in the list.</p>
Attribute value - originating Signaling Gateway match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Originating Signaling Gateway.</p> <p>Specifies how to match on the Incoming Media - originating Signaling Gateway attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value - originating Signaling Gateway	Change	<p>This field appears only if Attribute value - originating Signaling Gateway match is visible and set to Exact. Specifies the value of the Signaling Gateway attribute that matches this entry. This attribute specifies the MetaSwitch Signaling Gateway at which the call originated (in the case where the MetaSwitch NE includes two or more Signaling Gateways to support different point codes).</p> <ul style="list-style-type: none"> • For calls from subscribers on the switch, the value is taken from the Subscriber Group configuration. • For calls received over SS7, the value is taken from the signaling gateway on which the ISUP IAM was received. • For other calls, the signaling gateway is not initially specified. If required, you can set it during number validation using the Signaling Gateway attribute. <p>Select from the list of configured Signaling Gateways.</p>
Attribute value – ANI II digits match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to ANI II digits. Specifies how to match on the ANI II digits attribute. Values:</p> <ul style="list-style-type: none"> • Exact • Match any if present (default) • Match even if not present • Only match if absent
Attribute value – ANI II digits	Change	<p>This field appears only if Attribute value - ANI II digits match is visible and set to Exact. Specifies the value of the ANI II digits attribute that matches this entry. Specify a value in the range 0 - 99. The default is 0.</p>

Parameter	Access	Description
Attribute value – US Call Type match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to US Call Type.</p> <p>Specifies how to match on the US Call Type attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – US Call Type	Change	<p>This field appears only if Attribute value - US Call Type match is visible and set to Exact.</p> <p>Specifies the value of the US Call Type attribute that matches this entry. Values:</p> <ul style="list-style-type: none">• Unknown (default)• Operator• Emergency• Local• IntraLata• IntraLata national• IntraLata international• Toll Free• Premium• Other non-geographic• Operator Service• Directory Assist• FGD cut through• FGB• International toll free• Other N11• International• Other
Attribute value – UK Call Type match	Change	<p>This field is valid only in the UK.</p>
Attribute value – UK Call Type	Change	<p>This field is valid only in the UK.</p>

Parameter	Access	Description
Attribute value – Dialed Prefix match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Dialed Prefix.</p> <p>Specifies how to match on the Dialed Prefix attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – Dialed Prefix	Change	<p>This field appears only if Attribute value - Dialed Prefix match is visible and set to Exact.</p> <p>Specifies the value of the Dialed Prefix attribute that matches this entry. Values:</p> <ul style="list-style-type: none">• Unknown (default)• 1+• 0-• 0+• None
Attribute value – Dialing Pattern match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Dialing Pattern.</p> <p>Specifies how to match on the Dialing Pattern attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – Dialing Pattern	Change	<p>This field appears only if Attribute value - Dialing Pattern match is visible and set to Exact.</p> <p>Specifies the value of the Dialing Pattern attribute that matches this entry. Values:</p> <ul style="list-style-type: none">• 7 digits (default)• 10 digits• 0+10 digits• 1+10 digits• Other

Parameter	Access	Description
Attribute value – User Defined 1 - 20 match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to one of the values User Defined 1 - User Defined 20. If you have selected two or more User Defined Attributes as match attributes, this field appears once for each selected attribute.</p> <p>Indicates how to match on a User Defined Attribute. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – User Defined 1 - 20	Change	<p>This field appears only if Attribute value - User Defined 1 - 20 match is set to Exact. If you have selected two or more User Defined Attributes as match attributes, this field appears once for each selected attribute.</p> <p>Specifies the value of the User Defined Attribute that matches this entry. Specify an integer value in the range 0 - 2147483646.</p>
Attribute value – Line Class Code 1 - 20 match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to one of the values Line Class Code 1 - Line Class Code 20. The field name indicates LCC n - description (showing the index value in the range 1-20 and the configured description, if any).</p> <p>Indicates how to match on a Line Class Code value defined for the subscriber associated with the Routing request. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value – Line Class Code 1 - 20	Change	<p>This field appears only if Attribute value - Line Class Code 1 - 20 match is set to Exact. The field name indicates LCC <i>n</i> - description (showing the index value in the range 1-20 and the configured description, if any). Indicates the Line Class Code associated with the Routing request. Specify the Line Class Code as an integer value in the range 0 - 2147483646. Alternatively, if one or more valid values have been configured in the Line Class Code object, you can select one of these values by clicking on the ellipsis symbol at the end of the field. Either scroll down the alphabetic list of code value descriptions to select the value you want, or type the first few letters of the code's description so that the alphabetic list scrolls to select the entry you want.</p>
Attribute value – User defined MF call type match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to User defined MF call type. Indicates how to match on the User defined MF call type value associated with the Routing request (which is available only for calls that came into the NE over MF, and is set up in the MF Incoming Call Profile). Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – User defined MF call type	Change	<p>This field appears only if Attribute value - User defined MF call type match is set to Exact. Indicates the User defined MF call type associated with the Routing request. Specify the call type as an integer value in the range 0 - 4294967295.</p>

Parameter	Access	Description
Attribute value – ANI Screening Entry match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to ANI Screening Entry.</p> <p>Indicates how to match on the ANI Screening Entry associated with the Routing request. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – ANI Screening Entry	Change	<p>This field appears only if Attribute value - ANI Screening Entry match is set to Exact.</p> <p>Indicates the type of ANI Screening Entry, if any, associated with the Routing request. Values:</p> <ul style="list-style-type: none">• Not matched (default)• Allowed• Denied
Attribute value – ANI Screening Lookup match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to ANI Screening Lookup.</p> <p>Indicates how to match on the ANI Screening Lookup type associated with the Routing request. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value – ANI Screening Lookup	Change	<p>This field appears only if Attribute value - ANI Screening Lookup match is set to Exact.</p> <p>Indicates the type of ANI Screening Lookup, if any, associated with the Routing request. Values:</p> <ul style="list-style-type: none">• None (default)• Lookup on carrier code (North America only)• Lookup in specific table
Attribute value – Transit Network ID match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Transit Network ID.</p> <p>Indicates how to match on the Transit Network ID associated with the Routing request. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – Transit Network ID	Change	<p>This field appears only if Attribute value - Transit Network ID match is set to Exact.</p> <p>Indicates the Transit Network ID associated with the Routing request. Specify a value in the range 0 - 9999.</p>

Parameter	Access	Description
Attribute value – ESA Status match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to ESA Status.</p> <p>Indicates how to match on the Emergency Standalone (ESA) status associated with the Routing request. This allows you to perform number validation and routing differently during ESA operation; for example, you could reject calls to numbers that cannot be contacted using ESA, or reroute calls to use only the trunks that are available during ESA operation. Select one of the following values.</p> <ul style="list-style-type: none">• Specific ESA in control• Any ESA in control (default)• Any• Main Call Agent in control
Attribute value – controlling ESA Protection Domain	Change	<p>This field appears only if Attribute value - ESA Status match is set to Specific ESA in control.</p> <p>Indicates the ESA Protection Domain associated with the Routing request. Select from the drop-down list of configured ESA Protection Domains.</p>
Attribute value – subscriber NV and routing attributes match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Subscriber NV and routing attributes.</p> <p>Specifies how to match on the subscriber routing attributes. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value – subscriber NV and routing attributes	Change	<p>This field appears only if Attribute value - Subscriber NV and routing attributes match is visible and set to Exact.</p> <p>Specifies the values of the subscriber routing attributes that match this entry. Select one or more of the following values:</p> <ul style="list-style-type: none">• Pre-paid / off-switch calling card subscriber• Fax / modem subscriber• Nomadic subscriber
Attribute value – bearer capability match	Change	<p>This field appears only if one of the Match attribute fields of the parent Number Validation Table is set to Bearer capability.</p> <p>Specifies how to match on the bearer capability that is being used by the call. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – bearer capability	Change	<p>This field appears only if Attribute value - bearer capability match is visible and set to Exact.</p> <p>Specifies the values of the bearer capability attribute that match this entry. If the call's bearer capability matches any of the values selected here, this entry counts as a match. Select one or more of the following values:</p> <ul style="list-style-type: none">• Speech or 3.1kHz audio• 64kbps data• 64kbps restricted• 56kbps data

Parameter	Access	Description
Requested status	Read only	Specifies whether an administrator has attempted to enable the Number Validation Entry. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of the Number Validation Entry. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

Number Actions

The **Number action - called number action**, **Number action - calling party number action** and **Number action - charge number** parameters in the Number Validation Entry object provides a mechanism for editing the specified number.

The parameter consists of a character string specifying one or more edit actions to be applied to the number. Valid edit actions are:

PA <i>digits</i>	Add a prefix to the number. The characters PA are followed immediately by the digit(s) to be added as a prefix.
PD <i>count</i>	Delete a prefix from the number. The characters PD are followed immediately by the count of digits to be deleted from the start of the number.
SD <i>count</i>	Delete a suffix from the number. The characters SD are followed immediately by the count of digits to be deleted from the end of the number.
SD #	Delete a trailing # character from the number, if present. No action if the last character of the number is not # .
R <i>digits</i>	Replace the complete number. The character R is followed immediately by the new digit string to replace the number.

The action string can contain two or more actions, which are executed in the order specified, so that the second acts on the modified number resulting from the first. Note that the Replace action cannot follow any other action because this would destroy the effect of the earlier action.

Examples of changes to the called number:

- **PD3PA010** replaces the first three digits of the called number with **010**. If the called address consisted of three or fewer digits, the called number becomes **010**.
- **SD2PD2** removes the last two and first two digits from the called number. If the called number consisted of fewer than five digits, there is now no called number.
- **R014402083661177** replaces the entire called number with **014402083661177**.

3.1.18 On-Switch and LNP Lookups

The On-Switch and LNP Lookups object is a child of the Config Set. It does not have any configurable parameters, but is used to group together the Lookup Number Block and Location Routing Number objects and to provide overall status information for them.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✓ Apply	✓ Reset Statistics	✓ Refresh
✓ Import	✓ Export	✓ Output

Parameter	Access	Description
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none"> • None • In progress • Succeeded • Failed
Import – mode	Change	Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values: <ul style="list-style-type: none"> • Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them. • Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them. • Overwrite or create No checking. The import operation will create or update objects as required.

Parameter	Access	Description
Import – file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.
Import – log correlator	Read only	If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.
Import - correlator metaswitch	Read only	If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.
Export – number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.

Parameter	Access	Description
Export – status	Read only	<p>The status of the current or most recent export operation, if any. Values:</p> <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export – file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.</p>
Export – log correlator	Read only	<p>If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Export - correlator metaswitch	Read only	<p>If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

3.1.19 Lookup Number Block

The Lookup Number Block object is a child of the On-Switch and LNP Lookups object.

Each Lookup Number Block object contains information about the telephone numbers expected to be present in a local area managed by the MetaSwitch NE. These include numbers that may be ported to or from the switch if Local Number Portability is allowed, and ranges of non-geographic numbers where some but not all numbers in the range are owned by the switch.

Actions

- | | | |
|----------|--------------------|--------------|
| ✓ Create | ✓ Enable | ✗ Activate |
| ✓ Delete | ✓ Disable | ✗ Deactivate |
| ✓ Apply | ✗ Reset Statistics | ✓ Refresh |
| ✗ Import | ✗ Export | ✓ Output |



Note that when the parent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the parent Config Set before you can modify the object.

Parameter	Access	Description
Number block prefix	Change	E164 address, including the NPA, which defines a block of telephone numbers.
Number block name	Change	A text string used in the EMS System Explorer to identify this Lookup Number Block object. Specify a string of up to 64 characters.

Parameter	Access	Description
Number block type	Change	<p>Specifies whether the block of telephone numbers is owned exclusively by this switch, or includes ported or non-geographic numbers. The values relating to ported numbers are valid only if the Config Set type of the parent Config Set is set to No LNP lookup or LNP lookup. Note that if a subscriber has Force LNP lookup set to True, this overrides the behavior described below, forcing a lookup even if the target number is found on this switch. Values:</p> <ul style="list-style-type: none">• Owned (default) The specified number block is owned exclusively by the switch for routing purposes. These numbers cannot be ported, and the NE will not do any LNP lookups for numbers in this block. Call routing attempts to numbers in this block will fail if the target number is not found on the switch.• Owned but may be ported away The specified number block is owned by the switch, but numbers within the block may have been ported away. The NE will first look for the number on the switch, but will do an LNP lookup if one has not already been done and the on-switch check fails. Call routing attempts to numbers in this block will fail if the LNP lookup returns the original number or this switch's LRN; otherwise the number returned by the LNP lookup is used for Trunk Routing.

Parameter	Access	Description
		<ul style="list-style-type: none"> <p>• Not owned but may be ported to The specified number block is not owned by this switch but numbers within it may be ported to this switch. The NE will first look for the number on this switch, but will do an LNP lookup if one has not already been done and the on-switch check fails. Call routing attempts to numbers in this block will fail if the LNP lookup returns this switch's LRN; otherwise the number returned by the LNP lookup is used for Trunk Routing.</p> <p>• Not owned but may be ported to served exchange The specified number block is not owned by this switch, but numbers within it may be ported to another exchange in the local area for which this switch provides LNP lookups. The NE will do an LNP lookup but will not look for the target number on this switch. Call routing attempts to numbers in this block will fail if the LNP lookup returns this switch's LRN; otherwise the number returned by the LNP lookup is used for Trunk Routing.</p> <p>• Sparsely owned The specified number block is a number range in which one or more numbers are owned by this switch but others may be owned by remote exchanges. This is used when non-geographic numbers are owned by this switch, or when one or more numbers in the range are owned by this switch but others are owned by a legacy Class 5 switch for which this switch may be providing Point Code Proxy functions. The NE will first look for the number on this switch, but will perform Trunk Routing if the target number is not found on the switch.</p>

Parameter	Access	Description
		<ul style="list-style-type: none"> • Sparsely owned and maybe ported away The specified number block is a number range in which one or more numbers are owned by this switch, one or more numbers are owned by a legacy Class 5 switch for which this switch provides Point Code Proxy functions, and others may be ported away from these switches. The NE will first look for the number on this switch, but will perform an LNP lookup followed by Trunk Routing if the target number is not found on the switch.
Associated Signaling Gateway	Change	<p>The Signaling Gateway associated with the local area. If Number Validation determines that an LNP request is required because the number belongs to this Lookup Number Block, the request will be sent from this Signaling Gateway (unless a different gateway is specified as part of the routing attributes). Select from the displayed list of Signaling Gateways, or select None if you do not want to specify one. If no gateway is specified here or in routing, or if the gateway specified here has been deleted, the query is sent from the originating Signaling Gateway associated with the call (if any), or from any Signaling Gateway that has a suitable Local Service Access Point configured.</p>
Requested status	Read only	<p>Specifies whether an administrator has attempted to enable the Lookup Number Block. Values:</p> <ul style="list-style-type: none"> • Enabled The object has been enabled. • Disabled The object has not been enabled or has been disabled..

Parameter	Access	Description
Actual status	Read only	Specifies the current status of the Lookup Number Block. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

3.1.20 Location Routing Number

Each Location Routing Number object is a child of the On-Switch and LNP Lookups object below a Config Set object with **Config Set type** set to **No LNP lookup** (North America only) or **LNP lookup** (North America only).

A Location Routing Number (LRN) identifies an exchange. (Note that an exchange may have multiple LRNs, but each LRN is unique to a exchange.) Each Subscriber Group (and therefore each subscriber) is associated with a Location Routing Number (which identifies the exchange to which they are subscribed), and each LRN must refer to a unique Subscriber Group. Location Routing Numbers are used during Local Number Portability processing.

- When LNP lookup is performed, if the number has been ported, the dialed number is replaced with the LRN (and the dialed number is stored). The call is then routed to the exchange that owns the LRN (where the dialed number is reinstated to enable routing to the subscriber.)
- When an outgoing call request is established, the first six digits of the LRN (NPA-NXX) associated with the subscriber making the call is appended to the call setup request.



Note that when the parent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the parent Config Set before you can modify the object.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✗ Export	✓ Output

Parameter	Access	Description
Name	Change	Unique user-friendly name identifying the Location Routing Number. Specify a name of up to 64 characters. If a name is not specified, the EMS displays a default.
Subscriber Group	Change	The Subscriber Group with which this LRN is associated. This must not match the Subscriber Group selected for any other LRN. Select from the list of configured Subscriber Groups.

Parameter	Access	Description
Primary LRN	Change	The primary LRN used to identify the exchange. This is an E164 address. The first six digits are NPA-NXX, where NPA can be used to identify numbers in this rate center, and all unported numbers on this exchange begin NPA-NXX.
Secondary LRN	Change	The secondary LRN used to identify the exchange. This is an E164 address. It is typically used only for maintenance purposes.
Requested status	Read only	Specifies whether an administrator has attempted to enable this Location Routing Number object. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of this Location Routing Number object. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

3.1.21 Trunk Routing

The Trunk Routing object is a child of the Config Set. It does not have any configurable parameters, but is used to group together the Routing Table objects and to provide overall status information for them.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✓ Apply	✓ Reset Statistics	✓ Refresh
✓ Import	✓ Export	✓ Output

Parameter	Access	Description
Routing Table Attend To Dependent alarms	Read only	The total number of Routing Table children of this object that are in Attend To Dependent state.
Routing Table Attend To Dependent alarm events	Read only / Reset	The total number of Attend To Dependent alarms for all Routing Table children of this object.
Summary child alarm state	Read only	Summarizes the alarm status for all children of this object. Values: <ul style="list-style-type: none"> • Clear No alarms are currently raised. • Attention Required Attention Required - one or more child objects are not operating normally, and need operator intervention. • Attend To Dependent Attention Required elsewhere - another object on which one or more child objects depend is not operating normally.
Import – number of objects imported	Read only	The total number of objects (including child objects) read from the import file so far in the current or most recent import operation.

Parameter	Access	Description
Import – status	Read only	The status of the current or most recent import operation, if any. Values: <ul style="list-style-type: none">• None• In progress• Succeeded• Failed
Import – mode	Change	Whether the imported information is to replace existing EMS objects or to add new ones. This field provides additional checking on the import operation if required. Values: <ul style="list-style-type: none">• Do not overwrite The imported information is to add new objects. If the file contains objects that already exist in the EMS, the import operation will fail and will not overwrite them.• Do not create The imported information is to update existing objects. If the file contains objects that do not already exist in the EMS, the import operation will fail and will not create them.• Overwrite or create No checking. The import operation will create or update objects as required.
Import – file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) from which configuration information for this object will be imported. The maximum length of the filename is 32 characters.
Import – log correlator	Read only	If the import status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.

Parameter	Access	Description
Import - correlator metaswitch	Read only	If the import status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.
Export – number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export – status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export – file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.

Parameter	Access	Description
Export – log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the ‘go to log’ button next to this field to jump to this message in the EMS log viewer window.
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.

3.1.22 Routing Table

The Routing Table objects are children of a Trunk Routing object.

Each Routing Table has multiple child Routing Actions. The Routing Table object defines the method or attributes used to select a Routing Action from within the table to route a particular call.



Note that when the parent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the parent Config Set before you can modify the object.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✓ Export	✓ Output

Parameter	Access	Description
Routing Table index	Create	Unique numerical index identifying the Routing Table. This field is optional; if you do not supply a value, the EMS assigns one.
Routing Table type	Change	Type of routing input to be used to look up entries in this routing table (which corresponds to the type of the key fields in the routing entries). Ideally, this field should be set before you create any Routing Action child objects for this routing table. If you change the routing table type after creating one or more child Routing Actions, these child objects may not contain values for fields that are required by the new routing table type. In this case you must check the configuration of each Routing Action that is a child of this Routing Table, and supply any missing parameter values, before you can activate the parent Config Set in order to use this Routing Table. Values: <ul style="list-style-type: none"> • Destination address The destination address of the call is used to select a Routing Action in this table.

Parameter	Access	Description
		<ul style="list-style-type: none"> <p>Source address The source address of the call is used to select a Routing Action in this table. For a call originating on the switch, the source address is the calling party's number, or (if the call has been forwarded by call forwarding on this NE) the number of the last party that forwarded the call. For a call received over a trunk or from an application server, the source address is the calling party address as signaled by the peer equipment.</p> <p>Transit address (North America only) The selected carrier for the call is used to select a Routing Action in this table.</p> <p>Current time The current time is used to select a Routing Action in this table. Note that the time used is the local time of the Call Agent or Integrated Softswitch.</p> <p>Sequential selection The Routing Actions in the table are selected sequentially.</p> <p>Weighted random A Routing Action in the table is selected using a weighted random method. The weighting of each action is specified in the configuration for that action.</p> <p>Sticky random A Routing Action in the table is initially selected using a weighted random method. This action is then used until a routing request is rejected. Another action is then selected by weighted random and used until a request is rejected.</p>

Parameter	Access	Description
		<ul style="list-style-type: none">• Call gapping There must be a defined interval before a Routing Action can be selected again. If multiple actions have not been selected for a period of time greater than the defined interval, one of these actions is selected at random.• Incoming Media type The incoming media type associated with the call is used to select a Routing Action. This is the type of exchange that originated the call or from which the call was received (this exchange, any other exchange, or a specified exchange).• Subscriber NV and routing attributes The subscriber routing attributes associated with the call are used to select a Routing Action.• Number Validation Attributes One or more of the attributes set up during Number Validation are used to select a Routing Action.• Incoming release cause The release cause associated with the call, if any, is used to select a Routing Action. A release cause will be present only if an earlier attempt to route the call failed and re-routing is now being attempted.• Bearer capability The bearer capability associated with the call is used to select a Routing Action.

Parameter	Access	Description
Match Attribute 1	Change	<p>This field appears only if Routing Table Type is set to Number Validation Attributes. A Number Validation attribute that is to be used to look up entries in this Routing Table. You can specify up to three attributes to be used in matching entries in this table, in this field and the following two fields. Values:</p> <ul style="list-style-type: none"> • ANI II Digits (North America only) • CIP (North America only) • Dialed Prefix (North America only) • Dialing Pattern (North America only) • ESA Status (North America only) • Line Class Code 1 - Line Class Code 20 Each of the 20 Line Class Code options appears in this list only if you have configured a Line Class Code object with the corresponding numeric index value. It appears as LCC <i>n</i> - description (showing the index value in the range 1-20 and the configured description, if any). • Operator call • Originating Signaling Gateway • Subscriber Group • UK Call Type • US Call Type • User Defined Attribute 1 - User Defined Attribute 20 Each of the 20 User Defined Attribute options appears in this list only if you have configured a User Defined Attribute object with the corresponding numeric index value. It appears as UDA <i>n</i> - description (showing the index value in the range 1-20 and the configured description, if any).

Parameter	Access	Description
Match Attribute 2	Change	This field appears only if Routing Table Type is set to Number Validation Attributes . A Number Validation attribute that is to be used to look up entries in this Routing Table. The valid values are the same as for Match Attribute 1 .
Match Attribute 3	Change	This field appears only if Routing Table Type is set to Number Validation Attributes . A Number Validation attribute that is to be used to look up entries in this Routing Table. The valid values are the same as for Match Attribute 1 .
Routing Table name	Change	Unique user-friendly name identifying the Routing Table. Specify a name of up to 32 characters. If a name is not specified, the EMS displays a default.
Routing Action Attend To Dependent alarms	Read only	The total number of Routing Action children of this object that are in Attend To Dependent state.
Routing Action Attend To Dependent alarm events	Read only / Reset	The total number of Attend To Dependent alarms for all Routing Action children of this object.
Summary child alarm state	Read only	Summarizes the alarm status for all children of this object. Values: <ul style="list-style-type: none">• Clear No alarms are currently raised.• Attention Required Attention Required - one or more child objects are not operating normally, and need operator intervention.• Attend To Dependent Attention Required elsewhere - another object on which one or more child objects depend is not operating normally.

Parameter	Access	Description
Export – number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.
Export – status	Read only	The status of the current or most recent export operation, if any. Values: <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export – file	Change	The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.
Export – log correlator	Read only	If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.

Parameter	Access	Description
Export - correlator metaswitch	Read only	If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.
Requested status	Read only	Specifies whether an administrator has attempted to enable the Routing Table. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of the Routing Table. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

3.1.23 Routing Action

Each Routing Action object is a child of a Routing Table object.

Each object contains information about a particular routing action in a routing table and how it is selected.



Note that when the parent Config Set is active, this object cannot be modified; all fields are read only and all actions are disabled. You must deactivate the parent Config Set before you can modify the object.



Where routing actions are based on the current time, this uses the local time of the Call Agent or Integrated Softswitch.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✗ Export	✓ Output

Parameter	Access	Description
Description	Change	A text string used in the EMS System Explorer to identify this Routing Action. Specify a string of up to 32 characters.

Parameter	Access	Description
Incoming release cause match	Change	<p>This field appears only if the Routing table type field of the parent Routing Table is set to Incoming release cause. Specifies how to match on the incoming release cause. Values:</p> <ul style="list-style-type: none">• No release cause (default) Match only if the call has no associated release cause (for example on the first pass through routing).• ISUP/ISDN release cause If the last attempted routing of the call was over an ISUP or ISDN trunk, match on a specific release cause value from this attempt (identified in the Incoming release cause field). This option is used in re-routing a call based on the release cause from the previous routing attempt.• Any release cause if present Match if the call has any associated release cause value, including those resulting from attempts to route the call over a SIP or MF trunk.• Match any Match any call regardless of whether it has an associated release cause.
Incoming release cause	Change	<p>This field appears only if Incoming release cause match is visible and set to ISUP/ISDN release cause. Specifies the value of the incoming release cause that matches this entry. The valid values for this attribute are a subset of those defined in Q.850; the other values defined in Q.850 identify release causes for which re-routing is not appropriate, or are not appropriate to ISUP and ISDN trunks. See Incoming Release Causes below for a full list of values and some restrictions on their use.</p>

Parameter	Access	Description
Address type	Change	<p>This field appears only if the Routing table type field of the parent Routing Table is set to Destination address, Source address or Transit address. Type of address used to match this action. Values:</p> <ul style="list-style-type: none"> • Not present Matches absence of address. • E.164 Matches destination and source addresses. • Network ID Matches transit network addresses.
Address scope	Change	<p>This field appears only if the Address type field is visible and set to E.164. Scope of address used to match this action. Values:</p> <ul style="list-style-type: none"> • Unknown • International • National • Subscriber • No number • UK specific • Match any (default)

Parameter	Access	Description
Wildcard address type	Change	<p>This field appears only if the Routing table type field of the parent Routing Table is set to Destination address, Source address or Transit address. Type of wildcard address used to match this action. Values:</p> <ul style="list-style-type: none">• Explicit wildcard Match on the exact address, as specified in the Wildcard address and Address type fields.• Full wildcard - any type Match on any address of any type.• Full wildcard - this type Match on any address with the address type specified in the Address type field.• Part wildcard header Match on an address with the address type specified in the Address type field that starts with the string specified in the Wildcard address field.
Wildcard address	Change	<p>This field appears only if the Wildcard address type is visible and set to Explicit wildcard or Part wildcard header. Wildcard address used to match this action.</p>
Wildcard address effective prefix length	Change	<p>This field appears only if the Routing table type field of the parent Routing Table is set to Destination address, Source address or Transit address and the Address type is not set to Not present and the Wildcard address type is Part wildcard header. Length, in bytes, of the wildcard address effective prefix used to match this action. The effective prefix length is used to determine the precedence of alternative wildcard address matches. If the effective prefix length is the same as the actual length of the wildcard address, set this field to zero. The default is zero.</p>

Parameter	Access	Description
Subscriber NV and routing attributes	Change	<p>This field appears only if the Routing table type field of the parent Routing Table is set to Subscriber NV and routing attributes.</p> <p>Subscriber routing attributes used to match this action. If required, select one or more of the following values:</p> <ul style="list-style-type: none">• Pre-paid / off-switch calling card subscriber• Fax / modem subscriber• Nomadic subscriber
Incoming Media type	Change	<p>This field appears only if the Routing table type field of the parent Routing Table is set to Incoming Media type. Type of exchange used to match this action. Values:</p> <ul style="list-style-type: none">• Local Match on this switch.• Remote (any) Match on any remote exchange.• Remote (specified signaling stack) Match on the signaling stack type specified in the Incoming Media - Remote Signaling Stack field.• Remote (specified exchange) Match on the remote exchange specified in the Incoming Media - Remote Exchange field.• Remote (specified media channel) Match on the media channel specified in the Incoming Media - Remote Media Channel field.
Incoming Media - Remote Signaling Stack	Change	<p>This field appears only if the Incoming Media type is visible and set to Remote (specified signaling stack). Signaling stack type used to match this action. Values:</p> <ul style="list-style-type: none">• ISUP• MF• ISDN• SIP

Parameter	Access	Description
Incoming Media - ISUP Local Signaling Destination	Change	This field appears only if Incoming Media - Remote Signaling Stack is visible and set to ISUP . ISUP Local Signaling Destination used to match this action. Select from the displayed list of ISUP Local Signaling Destinations that are associated with a valid Signaling Gateway.
Incoming Media - Remote Exchange	Change	This field appears only if Incoming Media type is visible and set to Remote (specified exchange) . Remote exchange used to match this action. Click on the ellipsis symbol to the right of this field to choose MF, ISDN, ISUP or SIP, then follow the dialogs to select the appropriate exchange.
Incoming Media - Remote Media Channel	Change	This field appears only if the Incoming Media type is visible and set to Remote (specified media channel) . Remote media channel used to match this action. Click on the ellipsis symbol to the right of this field to choose MF, ISDN, ISUP or SIP, then follow the dialogs to select the appropriate channel or trunk from the list. Media channels or ISDN PRIs that support only outgoing calls cannot be used to match this action and do not appear in the list.

Parameter	Access	Description
Routing precedence	Change	<p>This field and the following fields (Valid from, Valid until, Route from, and Route until) are visible only if the Routing table type field of the parent Routing Table is set to Current time. Each Routing Action in the table defines a specific period of time within the week for which it applies, together with a start and end date for its validity. The routing precedence is used to resolve conflicts when there are two or more Routing Actions that apply at the same time; the action with the higher routing precedence is used.</p> <p>Specify a numeric value, which should not match the routing precedence of any other action in the table that can apply at the same time as this one (as defined by the following fields).</p>
Valid from (year)	Change	The year in which this routing action first becomes valid. Specify a four-digit value.
Valid from (month)	Change	The month in which this routing action first becomes valid. Specify this as a numeric value (1 for January, 12 for December).
Valid from (date)	Change	The date within the month on which this routing action first becomes valid.
Valid until (year)	Change	The year in which this routing action ceases to be valid. Specify a four-digit value.
Valid until (month)	Change	The month in which this routing action ceases to be valid. Specify this as a numeric value (1 for January, 12 for December).
Valid until (date)	Change	The date within the month on which this routing action ceases to be valid.

Parameter	Access	Description
Route from (day)	Change	The first day of the week on which this routing action applies. Values: Monday - Sunday .
Route from (hour)	Change	The hour on the specified day in which this routing action starts to apply. Range: 0 - 23.
Route from (minute)	Change	The minute past the specified hour at which this routing action starts to apply. Range: 0 - 59.
Route until (day)	Change	The last day of the week on which this routing action applies. Values: Monday - Sunday .
Route until (hour)	Change	The hour on the specified day in which this routing action ceases to apply. Range: 0 - 23.
Route until (minute)	Change	The minute past the specified hour at which this routing action ceases to apply. Range: 0 - 59.
Action probability	Change	This field appears only if the Routing table type field of the parent Routing Table is set to Weighted random or Sticky random . Probability, expressed as a percentage, of selecting this Routing Action. Range: 0 - 100. The action probabilities for all Routing Actions within the parent Routing Table must be chosen so that the total is 100%.
Bearer capability match	Change	This field appears only if the Routing table type field of the parent Routing Table is set to Bearer capability . Specifies how to match on the bearer capability that is being used by the call. Values: <ul style="list-style-type: none">• Exact• Always match (default)

Parameter	Access	Description
Bearer capability	Change	<p>This field appears only if Bearer capability match is visible and set to Exact.</p> <p>Specifies the values of the bearer capability attribute that match this entry. If the call's bearer capability matches any of the values selected here, this entry counts as a match. Select one or more of the following values:</p> <ul style="list-style-type: none">• Speech or 3.1kHz audio• 64kbps data• 64kbps restricted• 56kbps data
Action	Change	<p>Type of routing action to be performed if this action is chosen. Values:</p> <ul style="list-style-type: none">• Routing complete Routing is complete; the call should be routed using the media channel specified in the Media channel field.• Reject The call cannot be routed; the routing request should be rejected.• Table lookup Another routing table, specified in Next table, should be processed.• Return for reroute The call cannot be routed using the current Routing Table. Processing should return to the previous Routing Table and continue with an alternative matching Routing Action from that table, if one can be found.

Parameter	Access	Description
Media channel	Change	<p>This field appears only if Action is set to Routing complete.</p> <p>The Media Channel to be used for routing if this action is chosen. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. Media channels or ISDN PRIs that support only incoming calls cannot be used for routing and do not appear in the list.</p>
Next table	Change	<p>This field appears only if Action is set to Table lookup.</p> <p>Next table to use in continued routing. Select from the displayed list of Routing Tables (which are all children of this Routing Action's grandparent Config Set).</p> <p>As a short-cut to select the Routing Table, you can type match details into the field and click on the search button to select from a list of items that match these details. Match details can be a text string, a wildcard string such as B*, a range such as CA-FL, an index value such as =3, or an index range such as =1-20. For more details, refer to the description of the Details panel in <i>Operations Manual: Overview</i>.</p>

Parameter	Access	Description
Temporary Alternate Routing indicator	Change	<p>This field appears only if Action is set to Routing complete and the media channel selected in the Media channel field is an ISUP media channel rather than an MF media channel.</p> <p>Specifies whether this route is a temporary alternate route. This value is signalled over ISUP so that the call will not be routed on subsequent Temporary Alternate Routes. This mechanism is used to avoid calls taking unreasonable routes and to avoid possible routing loops in the network. Values:</p> <ul style="list-style-type: none">• True• False (default)
Call gapping interval	Change	<p>This field appears only if the Routing table type field of the parent Routing Table is set to Call gapping.</p> <p>Time, in milliseconds, for which this action becomes unavailable each time it is chosen when the Routing table type field of the parent Routing Table is set to Call gapping.</p> <p>Range : 0 - 86400000</p>
Attribute value – operator call match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to Operator call.</p> <p>Specifies how to match on the operator call attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value - operator call	Change	<p>This field appears only if Attribute value - operator call match is visible and set to Exact.</p> <p>Specifies the value of the operator call attribute (whether or not the call should be treated as an operator call) that matches this entry. Values:</p> <ul style="list-style-type: none">• True• False

Parameter	Access	Description
Attribute value – Subscriber Group match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to Subscriber Group.</p> <p>Specifies how to match on the subscriber group attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value - Subscriber Group	Change	<p>This field appears only if Attribute value - Subscriber Group match is visible and set to Exact. Specifies the value of the Subscriber Group attribute that matches this entry.</p> <ul style="list-style-type: none">• For calls originating on this switch, this indicates the Subscriber Group with which the calling party is associated.• For calls originating at a different exchange, this attribute is set to zero. <p>The value of this attribute determines which Digit Map is used, and may be involved in number validation and routing decisions.</p> <p>Select from the list of configured Subscriber Groups.</p>
Attribute value – US Call Type match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to US Call Type.</p> <p>Specifies how to match on the US Call Type attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value - US Call Type	Change	<p>This field appears only if Attribute value - US Call Type match is visible and set to Exact. Specifies the value of the US Call Type attribute that matches this entry. Values:</p> <ul style="list-style-type: none">• Unknown (default)• Operator• Emergency• Local• IntraLata• IntraLata national• IntraLata international• Toll Free• Premium• Other non-geographic• Operator Service• Directory Assist• FGD cut through• FGB• International toll free• Other N11• International• Other
Attribute value – UK Call Type match	Change	<p>This field is valid only in the UK.</p>
Attribute value - UK Call Type	Change	<p>This field is valid only in the UK.</p>
Attribute value – CIP match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to CIP. Specifies how to match on the Carrier Identification Parameter (CIP) attribute. Values:</p> <ul style="list-style-type: none">• Exact• Match even if not present (default)• Match any if present• Only match if absent

Parameter	Access	Description
Attribute value – CIP	Change	This field appears only if Attribute value - CIP match is visible and set to Exact . Specifies the value of the CIP attribute that matches this entry. Specify the CIP as a 4-digit number (with leading zeros if necessary).
Attribute value – ANI II digits match	Change	This field appears only if one of the Match attribute fields of the parent Routing Table is set to ANI II digits . Specifies how to match on the ANI II digits attribute. Values: <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – ANI II digits	Change	This field appears only if Attribute value - ANI II digits match is visible and set to Exact . Specifies the value of the ANI II digits attribute that matches this entry. Specify a value in the range 0 - 99. The default is 0.
Attribute value – Dialed Prefix match	Change	This field appears only if one of the Match attribute fields of the parent Routing Table is set to Dialed Prefix . Specifies how to match on the Dialed Prefix attribute. Values: <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value – Dialed Prefix	Change	This field appears only if Attribute value - Dialed Prefix match is visible and set to Exact . Specifies the value of the Dialed Prefix attribute that matches this entry. Values: <ul style="list-style-type: none">• Unknown (default)• 1+• 0-• 0+• None
Attribute value – Dialing Pattern match	Change	This field appears only if one of the Match attribute fields of the parent Routing Table is set to Dialing Pattern . Specifies how to match on the Dialing Pattern attribute. Values: <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – Dialing Pattern	Change	This field appears only if Attribute value - Dialing Pattern match is visible and set to Exact . Specifies the value of the Dialing Pattern attribute that matches this entry. Values: <ul style="list-style-type: none">• 7 digits (default)• 10 digits• 0+10 digits• 1+10 digits• Other

Parameter	Access	Description
Attribute value – User Defined 1 - 20 match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to one of the values User Defined 1 - User Defined 20. If you have selected two or more User Defined Attributes as match attributes, this field appears once for each selected attribute.</p> <p>Indicates how to match on a User Defined Attribute. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent
Attribute value – User Defined 1 - 20	Change	<p>This field appears only if Attribute value - User Defined 1 - 20 match is set to Exact. If you have selected two or more User Defined Attributes as match attributes, this field appears once for each selected attribute.</p> <p>Specifies the value of the User Defined Attribute that matches this entry. Specify an integer value in the range 0 - 2147483646.</p>
Attribute value – Line Class Code 1 - 20 match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to one of the values Line Class Code 1 - Line Class Code 20. If you have selected two or more Line Class Codes as match attributes, this field appears once for each selected Line Class Code.</p> <p>Indicates how to match on a Line Class Code value defined for the subscriber associated with the Routing request. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value – Line Class Code 1 - 20	Change	<p>This field appears only if Attribute value - Line Class Code 1 - 20 match is set to Exact. If you have selected two or more Line Class Codes as match attributes, this field appears once for each selected Line Class Code.</p> <p>Indicates the Line Class Code associated with the Routing request. Specify the Line Class Code as an integer value in the range 0 - 2147483646. The default is 0. Alternatively, for a validated Line Class Code, you can select a specific value from the list of valid values by clicking on the ellipsis symbol at the end of the field. Either scroll down the alphabetic list of code value descriptions to select the value you want, or type the first few letters of the code's description so that the alphabetic list scrolls to select the entry you want.</p>
Attribute value – originating Signaling Gateway match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to Originating Signaling Gateway.</p> <p>Indicates how to match on the Originating Signaling Gateway attribute. Select one of the following values.</p> <ul style="list-style-type: none">• Exact• Match any if present (default)• Match even if not present• Only match if absent

Parameter	Access	Description
Attribute value – originating Signaling Gateway	Change	<p>This field appears only if Attribute value - originating Signaling Gateway match is set to Exact. Indicates the Originating Signaling Gateway associated with the Routing request. This identifies the MetaSwitch Signaling Gateway at which the call originated (in the case where the MetaSwitch NE includes two or more Signaling Gateways to support different point codes).</p> <ul style="list-style-type: none">• For calls from subscribers on this switch, the value is taken from the Subscriber Group configuration.• For calls received over SS7, the value is taken from the signaling gateway on which the ISUP IAM was received.• For other calls, the signaling gateway is not initially specified. If required, you can set it during number validation using the Signaling Gateway attribute. <p>Select from the displayed list of Signaling Gateways.</p>
Attribute value – ESA Status match	Change	<p>This field appears only if one of the Match attribute fields of the parent Routing Table is set to ESA Status. Indicates how to match on the Emergency Standalone (ESA) status associated with the Routing request. This allows you to perform routing differently during ESA operation; for example, you could reject calls to numbers that cannot be contacted using ESA, or reroute calls to use only the trunks that are available during ESA operation. Select one of the following values.</p> <ul style="list-style-type: none">• Specific ESA in control• Any ESA in control (default)• Any• Main Call Agent in control

Parameter	Access	Description
Attribute value – controlling ESA Protection Domain	Change	This field appears only if Attribute value - ESA Status match is set to Specific ESA in control . Indicates the ESA Protection Domain associated with the Routing request. Select from the drop-down list of configured ESA Protection Domains.
Number action - called number action	Change	This field appears only if the Action field is set to Routing complete or Table lookup . A character string specifying the editing actions to be applied to the dialed number at the end of routing if this row is matched. The syntax of this string is described in Number Actions below. Specify a string of up to 32 characters.
Number action - calling party number action	Change	This field appears only if the Action field is set to Routing complete or Table lookup . A character string specifying the editing actions to be applied to the calling party number at the end of routing if this row is matched. The syntax of this string is described in Number Actions below. Specify a string of up to 32 characters.
Number action - charge number action	Change	This field appears only if the Action field is set to Routing complete or Table lookup . A character string specifying the editing actions to be applied to the charge number at the end of routing if this row is matched. The syntax of this string is described in Number Actions below. Specify a string of up to 32 characters.

Parameter	Access	Description
Optional attributes to set	Change	<p>Select which attributes are added to the routing request. The attributes selected in this field will affect the following fields. Select any combination of the following values:</p> <ul style="list-style-type: none">• AAR allowed *• ARR allowed *• Routing control (UK only)• Circuit code (North America only)• MF tandem routing code (North America only)• MF international non-operator routing code (North America only)• MF international operator routing code (North America only)• Max channel usage **• Congestion level 1 acceptance probability **• Congestion level 2 acceptance probability **• Maximum call duration• Outgoing ISUP/ISDN release cause <p>Note the following points about these attributes.</p> <ul style="list-style-type: none">• Attributes can be set in any Routing Action, whatever the value of the Action field. If two or more Routing Actions applied to the same call specify different values for the same attribute, the last specified value overrides any earlier values.• The attributes marked * above are set to True by default for all calls, unless a Routing Action explicitly sets them to False. If you do not want to use one of these features, select the appropriate attribute and then explicitly set it to False in the following field.• The attributes marked ** above are set to 100% by default for all calls, unless a Routing Action explicitly sets them to a lower value.

Parameter	Access	Description
AAR allowed	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. Attribute used internally to specify whether Automatic Alternative Routing is allowed if this action is chosen. If this field is set to True , the Routing Policy Services user may retry routing if media channel allocation fails. Values: <ul style="list-style-type: none">• True (default)• False
ARR allowed	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. Attribute specifying whether Automatic Re-Routing is allowed if this action is chosen. If this field is set to True , the Routing Policy Services User may retry routing if signaling fails due to congestion at a subsequent exchange. Values: <ul style="list-style-type: none">• True (default)• False
Routing control	Change	This field is not valid in North America.
Circuit code	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. Attribute indicating the Circuit Code to be included in the routing request if this action is chosen. This parameter is used only if the call is routed to a transit network. Range : 0 - 15

Parameter	Access	Description
MF tandem routing code	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. MF tandem routing code (OZZ) to be written back into the SETUP, used by the access tandem to identify the type of call. This parameter is used only if the call is routed over MF signaling. Range: 0 - 99
MF international non-operator routing code	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. MF international routing code for non-operator assisted calls (1NX) to be written back into the SETUP. This parameter is used only if an international call is routed over MF signaling. Range: 120 - 199
MF international operator routing code	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. MF international routing code for operator assisted calls (1N'X) to be written back into the SETUP. This parameter is used only if an international call is routed over MF signaling. Range: 120 - 199
Max channel usage	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. Maximum channel usage (as a percentage of the channel's total capacity) to be used in admission control, if this action is chosen. A media channel whose usage is higher than the maximum channel usage will be rejected by admission control. Range: 0 - 100. The default is 100 (indicating that the channel will be rejected only when it has no free capacity).

Parameter	Access	Description
Congestion level 1 acceptance probability	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. Attribute that is added to the routing request after the media channel is selected and used internally. It specifies the probability, expressed as a percentage, of accepting a signaling link congested at congestion level 1. Range: 0 - 100. The default is 100 (indicating that the link is always used even if it is congested).
Congestion level 2 acceptance probability	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. Attribute that is added to the routing request after the media channel is selected and used internally. It specifies the probability, expressed as a percentage, of accepting a signaling link congested at congestion level 2. Range: 0 - 100. The default is 100 (indicating that the link is always used even if it is congested).
Maximum call duration	Change	This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory. Attribute that is added to the routing request after the media channel is selected. It specifies the maximum permitted duration for a call. The call will be terminated if it continues for longer than the specified time; the duration is measured from the end of Routing processing in which the attribute is set. Specify the duration in minutes, in the range 1 - 1440 (1 minute - 24 hours), or specify zero to indicate no limit.

Parameter	Access	Description
Outgoing ISUP/ISDN release cause	Change	<p>This field appears only if this attribute is selected in the Optional Attributes to set field. If this field is visible, it is mandatory.</p> <p>Attribute that is added to the routing request after the media channel is selected. It indicates whether a specific release cause is to be reported to the originating switch if this call could not be routed on this switch, or if it was routed to another switch and was rejected there. The release cause will be reported only if the call was received over an ISUP or ISDN trunk.</p> <p>Note that setting a release cause does not in itself cause the call to be rejected. The valid values for this attribute are a subset of those defined in Q.850; the other values defined in Q.850 are not supported, generally because they do not apply to ISUP and ISDN trunks. See Outgoing Release Causes below for a full list of values and some restrictions on their use. Alternatively, you can specify Auto (the default) to indicate that the NE should use the release cause that it determined, or the release cause signaled by the terminating switch if the call was routed to another switch and was rejected there.</p>
Alarm state	Read only	<p>Specifies whether any alarms are currently raised for this object. Values:</p> <ul style="list-style-type: none"> • Clear No alarms are currently raised. • Attention Required Attention Required - the object is not operating normally, and needs operator intervention. • Attend To Dependent Attention Required elsewhere - another object on which this object depends is not operating normally.

Parameter	Access	Description
Alarm log correlator - Attend To Dependent	Read only	Identifier of the log message for the event that caused the last Attend To Dependent alarm state for this object. This field is reset when the Attend To Dependent alarm events field is reset to zero.
Attend To Dependent alarm events	Read only / Reset	Number of times (since the alarm count was reset) that this object's alarm state has gone to Attend To Dependent .
Alarm state changed timestamp	Read only	The time at which the Alarm state last changed.
Alarm events reset timestamp	Read only	The time at which the Attention Required alarm events was last reset to zero.
Requested status	Read only	Specifies whether an administrator has attempted to enable the Routing Action. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of the Routing Action. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

Number Actions

The **Number action - called number action**, **Number action - calling party number action** and **Number action - charge number** parameters in the Routing Action object provide a mechanism for editing the called number (or the calling party number, or charge number). This action is always applied after routing is complete, so that a subsequent Routing Action matching on one of these numbers uses the original numbers and not the edited numbers. If two or more editing actions are encountered while routing a call, only the last one is used at the end of routing.

The parameter consists of a character string specifying one or more edit actions to be applied to the number. Valid edit actions are:

PA <i>digits</i>	Add a prefix to the number. The characters PA are followed immediately by the digit(s) to be added as a prefix.
PD <i>count</i>	Delete a prefix from the number. The characters PD are followed immediately by the count of digits to be deleted from the start of the number.
SD <i>count</i>	Delete a suffix from the number. The characters SD are followed immediately by the count of digits to be deleted from the end of the number.
R <i>digits</i>	Replace the complete number. The character R is followed immediately by the new digit string to replace the number.

The action string can contain two or more actions, which are executed in the order specified, so that the second acts on the modified number resulting from the first. Note that the Replace action cannot follow any other action because this would destroy the effect of the earlier action.

Examples of changes to the called number:

- **PD3PA010** replaces the first three digits of the called number with **010**. If the called number consisted of three or fewer digits, the called number becomes **010**.
- **SD2PD2** removes the last two and first two digits from the called number. If the called number consisted of fewer than five digits, there is now no called number.
- **R014402083661177** replaces the entire called number with **014402083661177**.

Incoming Release Causes

When an outgoing call attempt sent over an ISUP or ISDN trunk is rejected because it cannot be routed, the remote switch can specify a release cause as an attribute to be signaled to the originating switch, which may help that switch to determine how to re-route the call.

The MetaSwitch NE supports the release cause values listed below, which are defined in the Q.850 specification. However, the Telcordia NI-2 and DMS-100 ISDN specifications state that some of the supported release cause values cannot be relayed back to an earlier switch, so the MetaSwitch NE automatically maps them to the nearest valid values before they can be matched in a Routing Action. (No mapping takes place for other ISDN variants.)

This mapping is indicated by a new release cause code value under the two **ISDN mapping** columns in the table. If this column indicates **Unchanged**, the release cause value is passed through unchanged.

Value	Description	NI-2 ISDN mapping	DMS-100 ISDN mapping
2	No route to specified transit network (national use)	Unchanged	Unchanged
3	No route to destination	Unchanged	Unchanged
34	No circuit / channel available	Unchanged	Unchanged
41	Temporary failure	Unchanged	Unchanged
42	Switching equipment congestion	Unchanged	Unchanged
43	Access information discarded	Unchanged	Unchanged
44	Requested circuit / channel not available	34	Unchanged
46	Precedence call blocked	Unchanged	Unchanged
47	Resource unavailable, unspecified	Unchanged	Unchanged
58	Bearer capability not presently available	Unchanged	Unchanged
62	Inconsistency in outgoing information element	Unchanged	Unchanged
63	Service or option not available, unspecified	Unchanged	Unchanged

Value	Description	NI-2 ISDN mapping	DMS-100 ISDN mapping
65	Bearer capability not implemented	Unchanged	Unchanged
69	Requested facility not implemented	Unchanged	Unchanged
70	Only restricted digital information bearer capability is available (national use)	Unchanged	Unchanged
79	Service option not implemented, unspecified	Unchanged	Unchanged
88	Incompatible destination	Unchanged	Unchanged
95	Invalid message, unspecified	Unchanged	41
97	Message type non-existent or not implemented	41	41
99	Information element / parameter non-existent or not implemented	41	41
102	Recovery on timer expiry	41	41
103	Parameter non-existent or not implemented - passed on (national use)	41	Unchanged
111	Protocol error, unspecified	41	41
127	Interworking, unspecified	Unchanged	Unchanged

Outgoing Release Causes

When an incoming call attempt received over an ISUP or ISDN trunk is to be rejected because it cannot be routed, you can specify a release cause as an attribute to be signaled to the originating switch, which may help that switch to determine how to re-route the call.

The MetaSwitch NE supports the release cause values listed below, which are defined in the Q.850 specification. However, you should note the following restrictions.

- Some of the supported release cause values are not valid over ISUP or ISDN, so the MetaSwitch NE automatically maps them to the nearest valid values for signaling to the originating switch.
This is indicated by a new release cause code value under **ISUP mapping** or **ISDN mapping** in the table. If this column indicates **Unchanged**, the release cause value is passed through unchanged.
In some cases, the ISUP mapping depends on the ISUP variant in use, as specified on the ISUP Local Signaling Destination that received the incoming call attempt; one mapping is used if the ISUP variant is **ANSI 1999**, and another mapping is used for all other variants.
- The Q.850 specification indicates that additional information should be signaled with some of the supported release cause values, but the MetaSwitch NE does not support signaling this additional information.
This is indicated under **Extra info?** in the table. If this column indicates **Yes**, you should ensure that the originating switch can handle the specified release cause without the additional information; otherwise using this release cause may result in alarm conditions or error logs at the originating switch.
- For ISDN, the release cause code 19 (User not answering) is suppressed (this is in line with the ISDN specification). If you specify this release cause code when rejecting an incoming call from an ISDN trunk, the ISDN release message is not sent.

Value	Description	ISUP mapping	ISDN mapping	Extra info?
1	Unallocated number	Unchanged	Unchanged	Yes
2	No route to specified transit network (national use)	Unchanged	Unchanged	Yes
3	No route to destination	Unchanged	Unchanged	Yes
4	Send special info tone	Unchanged	41	No

Value	Description	ISUP mapping	ISDN mapping	Extra info?
5	Misdialed trunk prefix	31 (ANSI), Unchanged (other variants)	28	No
6	Channel unacceptable	31	Unchanged	No
7	Call awarded to established channel	31	Unchanged	No
8	Call pre-empted	Unchanged	41	No
9	Call pre-empted, circuit reserved	Unchanged	17	No
16	Normal call clearing	Unchanged	Unchanged	Yes
17	User busy	Unchanged	Unchanged	Yes
18	User not responding	Unchanged	Unchanged	No
19	User not answering	Unchanged	Unchanged	No
20	Subscriber absent	Unchanged	19	No
21	Call rejected	Unchanged	Unchanged	Yes
22	Number changed	Unchanged	1	Yes
27	Destination out of order	Unchanged	Unchanged	No
28	Invalid number format	Unchanged	Unchanged	No
29	Facilities rejected	Unchanged	41	Yes
30	Response to status inquiry	31	Unchanged	No
31	Normal, unspecified	Unchanged	27	No
34	No circuit / channel available	Unchanged	Unchanged	No
38	Network out of order	Unchanged	41	No
41	Temporary failure	Unchanged	Unchanged	No

Value	Description	ISUP mapping	ISDN mapping	Extra info?
42	Switching equipment congestion	Unchanged	Unchanged	No
43	Access information discarded	Unchanged	Unchanged	Yes
44	Requested circuit / channel not available	Unchanged	Unchanged	No
46	Precedence call blocked	Unchanged	41	No
47	Resource unavailable, unspecified	Unchanged	41	No
50	Requested facility not subscribed	Unchanged	41	Yes
53	Outgoing calls barred within CUG	63 (ANSI), Unchanged (other variants)	41	No
55	Incoming calls barred within CUG	63 (ANSI), Unchanged (other variants)	41	No
57	Bearer capability not authorized	Unchanged	Unchanged	Yes
58	Bearer capability not presently available	Unchanged	34	Yes
62	Inconsistency in outgoing information element	Unchanged	41	No
63	Service or option not available, unspecified	Unchanged	41	No
65	Bearer capability not implemented	Unchanged (ANSI), 79 (other variants)	Unchanged	Yes
66	Channel type not implemented	79	41	Yes

Value	Description	ISUP mapping	ISDN mapping	Extra info?
69	Requested facility not implemented	Unchanged	65	Yes
70	Only restricted digital information bearer capability is available (national use)	Unchanged	41	No
79	Service option not implemented, unspecified	Unchanged	41	No
87	User is not a member of CUG	95 (ANSI), Unchanged (other variants)	41	No
88	Incompatible destination	Unchanged	Unchanged	No (ISUP), Yes (ISDN)
90	Non existent CUG	95 (ANSI), Unchanged (other variants)	41	No
91	Invalid transit network selection (national use)	Unchanged	41	No
95	Invalid message, unspecified	Unchanged	41	No
97	Message type non-existent or not implemented	Unchanged	41	Yes
98	Message not compatible with call state	Unchanged	41	Yes
99	Information element / parameter non-existent or not implemented	Unchanged (ANSI), 111 (other variants)	41	No (ISUP), Yes (ISDN)
102	Recovery on timer expiry	Unchanged	Unchanged	Yes

Value	Description	ISUP mapping	ISDN mapping	Extra info?
103	Parameter non-existent or not implemented - passed on (national use)	Unchanged	41	Yes
110	Unrecognized parameter discarded	Unchanged	41	Yes
111	Protocol error, unspecified	Unchanged	41	No
127	Interworking, unspecified	Unchanged	Unchanged	No

4. Call Verification

This chapter gives a brief overview of the test features supplied with the MetaSwitch Class 4/5 Softswitch and explains the EMS objects that define the tests.

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4.1 Overview of Call Verification


After you have created new Number Validation or Routing Tables, or modified existing tables, before you start using them, you should thoroughly test that they validate and route calls correctly. The Route Verification Testing objects included in the EMS can assist in this process.

The purpose of the route verification tests is to generate call setup requests that are processed by the number validation and routing tables. The call setup request is not passed into the network; it is dropped after the routing stage. The results of the route verification test report the status of the call setup request after the number validation stage and after the routing stage.



Note that call setup requests generated using call verification are always assumed to be voice calls and are routed as such. Call verification of ISDN data calls is not currently supported.

You can set up route verification tests to check scenarios in which you expect routing to fail, as well as those in which you expect it to succeed. As part of each test, you can specify the expected result (successful routing or a range of different failure modes), and the expected destination (a subscriber on the switch or one of a specified set of media channels). The results of running the test show whether it matched these expected parameters, as well as whether it succeeded or failed. This allows you to set up a number of standard tests, some of which should succeed and others of which should fail, and then verify that the results are the same after a configuration change.

If you configure an expected result for a route verification test, or for tests in an RVT Group, the Active symbol  displayed next to it in the EMS tree view shows the test status:

- A yellow exclamation mark shown over the green triangle indicates that the test has not yet been run (or not all the tests in the group have been run).
- A red exclamation mark shown over the green triangle indicates that the test has been run and has not performed as expected (or that one or more tests in the group have been run and have not performed as expected).
- The green triangle by itself indicates that the test has been run successfully (or that all tests in the group have been run successfully).

There are two types of route verification test supplied with the MetaSwitch Class 4/5 Softswitch:

- The Trunk Route Verification Test simulates a setup request received over an ISUP trunk, MF trunk, or SIP trunk.
- The Subscriber Route Verification Test simulates the setup of a call initiated by a subscriber on the switch dialing a number.

Because you may need to run similar tests for large numbers of telephone numbers or subscribers, the EMS provides Test Group objects, each of which allows you to set default parameter values for a group of trunk and/or subscriber route verification tests. This means that, for each individual test in the group, you simply need to set up a small number of parameters specific to each test (such as the telephone number to be tested). You can also modify the other parameters in the test if you need them to be different from the parent test group, but there is no need to do this if you simply want to use the defaults set up in the parent test group.

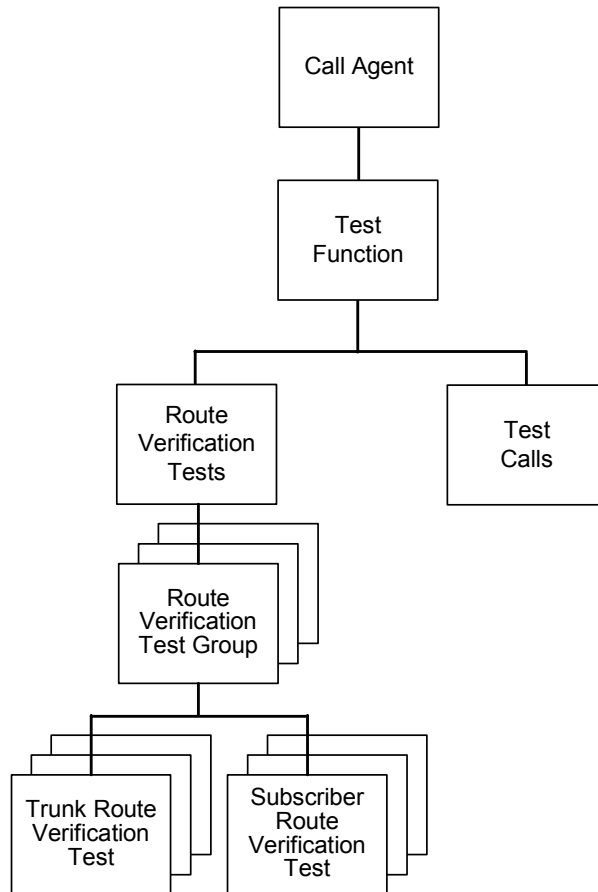
In addition, the MetaSwitch Class 4/5 Softswitch provides facilities for different types of test calls, which you can use to dial into this switch from another switch in order to check connectivity. You can use the EMS to configure how each of these test calls operates.

- Test Line 100 plays back a 1004Hz tone followed by silence. Optionally, the disconnect tone can be played intermittently during the silence.
- Test Line 101 connects the caller to a subscriber number, typically a subscriber in your central office. Apart from the use of the three digit number, this is identical to a normal call.
- Test Line 102 plays back a 1004Hz tone, or a tone alternating with periods of silence.
- Test Line 105 provides facilities for testing a trunk or subscriber line, measuring noise, loss and other variables. In order to provide this, a third party interrogator and responder are required. The MetaSwitch Class 4/5 Softswitch supports the use of any standards-compliant responder and interrogator. Interoperability has been tested with the Sage Instruments 930A equipment. You should not configure any Call Services on the subscriber line that Test Line 105 uses, with the exception of Busy Call Forwarding to allow multiple responders to be used.
- Test Line 108 connects the incoming and outgoing sides of the call in loopback mode, so that any sound sent to this switch is played back to the caller.

4.2 Objects

Figure 3 shows the Call Verification objects and how they are related.

Figure 3. Call Verification Objects



Note that the Test Calls configuration object has an associated statistics object that is not included in this diagram.

4.2.1 Test Function

The Test Function object is a child of the Config Set. It does not have any configurable parameters, but is used to group together the Route Verification Tests and Test Calls objects and to provide overall status information for them.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✗ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✗ Export	✓ Output

4.2.2 Route Verification Tests


Because there may be a large number of Route Verification Test Group and Route Verification Test objects configured, the EMS System Explorer groups them all under a single Route Verification Tests object. This grouping allows you to hide the individual objects in the Tree View panel so that you can concentrate on other objects in the tree.


The Route Verification Tests object does not have any fields or pushbuttons, and you cannot configure or manage it. It exists simply as a way of grouping the individual Route Verification Test Group objects.

The Route Verification Tests object is a child of the Test Function object.

Actions

✗ Create	✗ Enable	✗ Activate
✗ Delete	✗ Disable	✗ Deactivate
✗ Apply	✗ Reset Statistics	✓ Refresh
✓ Import	✗ Export	✓ Output

To view details of individual Route Verification Test Group objects, click on the  symbol next to the Route Verification Tests object. Click on the entry for an individual Route Verification Test Group to view its details.

To hide individual Route Verification Test Group objects, click on the  symbol next to the Route Verification Tests object.

4.2.3 Route Verification Test Group

The Route Verification Test Group object is a child of the Route Verification Tests object.

Each Route Verification Test Group allows you to set default parameter values for a group of trunk and/or subscriber route verification tests. This means that, for each individual test in the group, you simply need to set up a small number of parameters specific to each test (such as the telephone number to be tested). You can also modify the other parameters in the test if you need them to be different from the parent test group, but there is no need to do this if you simply want to use the defaults set up in the parent test group.

If you have filled in the **Expected result** fields on one or more tests in this group, to specify the results that you expect to get when running each test, the operational status symbol next to the Route Verification Test Group object in the EMS Tree View provides a quick view of whether the last run of the tests was as expected:

- A green "play" triangle indicates that all tests for which an expected result was configured ran as expected.
- A yellow exclamation mark overlaid on the green triangle indicates that one or more tests for which an expected result was configured have not been run since their configuration was last changed.
- A red exclamation mark overlaid on the green triangle indicates that at least one test has been run but the results were not as expected.



You can change the values of parameters in this object at any time. However, if a child Route Verification Test is running, and you change a parameter that could affect the results of the test, the test is canceled.

Actions

- | | | |
|----------|--------------------|--------------|
| ✓ Create | ✓ Enable | ✗ Activate |
| ✓ Delete | ✓ Disable | ✗ Deactivate |
| ✓ Apply | ✗ Reset Statistics | ✓ Refresh |
| ✗ Import | ✓ Export | ✓ Output |

Object-Specific Actions

- | | |
|------------------|--|
| Run all tests | To run all the Trunk Route Verification Tests and Subscriber Route Verification Tests that are children of this Test Group, click on the 'Run all tests' pushbutton. Note that this action is not available when the object is disabled. |
| Cancel all tests | To cancel the currently running test and abandon any other tests in the group that have not yet been run, click on the 'Cancel all tests' pushbutton. Note that this action is not available when no tests are running. |

Parameter	Access	Description
Test name	Change	Unique user-friendly name identifying the test group. Specify a name of up to 64 characters.
Default trunk routing config set	Change	Config Set over which tests in this group should be run. You can override this for a specific test if necessary. Select from the list of active Config Sets.
Default subscriber type	Change	Specifies whether the Dialed number in tests in this group identifies a configured subscriber or a hypothetical subscriber. You can override this for a specific test if necessary. Values: <ul style="list-style-type: none">• Configured• Hypothetical
Controlling ESA Protection Domain	Change	Specifies whether tests in this group are to simulate operation in Emergency Standalone (ESA) mode, and if so the ESA Protection Domain from which the test is to simulate running. Select from the drop-down list of ESA Protection Domains, or select None: Main Call Agent in control to run the test normally (not in ESA mode).
Default subscriber directory number	Change	Directory number of the Individual Line or PBX from which to simulate dialing for tests in this group. You can override this for a specific test if necessary. Either type in the number (which must match the directory number of a configured Individual Line or PBX), or click on the ellipsis symbol to the right of this field to select from a list of configured directory numbers.
Subscriber Group	Change	This field is valid only if Subscriber type is Hypothetical . Subscriber Group to which the hypothetical subscriber belongs. Select from the list of configured Subscriber Groups.

Parameter	Access	Description
Billing type	Change	This field is valid only if Subscriber type is Hypothetical . The billing type for the hypothetical subscriber for local calls. Values: <ul style="list-style-type: none">• Flat rate billing• Message rate billing• FX rate billing
Long distance carrier ID	Change	This field is valid only if Subscriber type is Hypothetical . The long distance carrier ID used by default for the hypothetical subscriber. This field may be left blank if you wish to simulate a situation in which the subscriber has not subscribed to a long distance carrier.
IntraLATA carrier ID	Change	This field is valid only if Subscriber type is Hypothetical . The intraLATA carrier ID used by default for the hypothetical subscriber. This field may be left blank if you wish to simulate a situation in which the subscriber has not subscribed to an intraLATA carrier.
International carrier ID	Change	This field is valid only if Subscriber type is Hypothetical . The international carrier ID used by default for the hypothetical subscriber. This field may be left blank if you wish to simulate a situation in which the subscriber has not subscribed to an international carrier.
Subscriber NV and routing attributes	Change	This field is valid only if Subscriber type is Hypothetical . Subscriber routing attributes for the hypothetical subscriber. If required, select one or more of the following values: <ul style="list-style-type: none">• Pre-paid / off-switch calling card subscriber• Fax / modem subscriber• Nomadic subscriber

Parameter	Access	Description
Remote media channel	Change	Remote media channel to be used as a match attribute in routing tables. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. Media channels or ISDN PRIs that support only outgoing calls cannot be used to match this action and do not appear in the list.
SIP type	Change	Set this field to indicate whether SIP trunks used by tests in this group support Basic SIP or SIP-T. Values: <ul style="list-style-type: none">• Basic SIP (default)• SIP-T
Calling number ANI II digits	Change	The ANI II digits present for the calling number. This field is not mandatory, but if specified should be two digits long. If this field is not completed, the default value, 00, is used.
Operator hold allowed	Change	Specifies whether operator hold is allowed on the call. Values: <ul style="list-style-type: none">• True• False (default)
Priority call	Change	Indicates whether the call requires priority handling. Values: <ul style="list-style-type: none">• True• False (default)
Use TCAP if required	Change	This field describes whether TCAP queries should be used for this routing test. Values: <ul style="list-style-type: none">• True• False (default)

Parameter	Access	Description
Ignore Originating Application Server	Change	This field is valid only if Subscriber type is Configured . Specifies whether the call setup request should ignore the subscriber's Originating Application Server, if one is configured, or should include routing to it. Values: <ul style="list-style-type: none">• True Generate the call setup request without routing to the server.• False Include routing to the server as part of the generated call setup request.
Ignore Terminating Application Server	Change	Specifies whether the call setup request should ignore the subscriber's Terminating Application Server, if one is configured, or should include routing to it. Values: <ul style="list-style-type: none">• True Generate the call setup request without routing to the server.• False Include routing to the server as part of the generated call setup request.
Incoming trunk group ID	Change	The Trunk Group ID of the incoming media channel. Range: 0 – 9999.
Calling party number	Change	The calling number on the ISUP message. This field is required if a successful TCAP query is to be performed for local number portability or toll free lookup as part of this test. Specify the number as a string of digits 0-9, or leave this field blank to indicate that no number is to be provided.
Calling number scope	Change	The area within which the calling number is unique. Values: <ul style="list-style-type: none">• Unknown• International• National (default)• Subscriber

Parameter	Access	Description
Calling number presentation restricted	Change	Specifies any restrictions on presenting the calling number to the called subscriber. Values: <ul style="list-style-type: none">• Allowed (default)• Restricted• Number not available• No indication
Test call	Change	Indicates whether the call is a test call. Values: <ul style="list-style-type: none">• True• False (default)
Operator call	Change	Specifies whether the routing request is for an operator call. Values: <ul style="list-style-type: none">• True• False (default)
Transit Network ID	Change	Identifier for the transit network to which the call should be routed.
Echo cancellation	Change	Specifies the echo cancellation requirements associated with the Routing request. Values: <ul style="list-style-type: none">• None (default)• Required• Preferred

Parameter	Access	Description
Line Class Code 1 - 20	Change	<p>This field is valid only if Subscriber type is Hypothetical. It appears once for each Line Class Code that you have configured below the Trunk Routing and Policy Services object.</p> <p>The Line Class Code value used for the hypothetical subscriber. Specify an integer value in the range 0 - 2147483646. The default is 0.</p> <p>Alternatively, for a validated Line Class Code, you can select a specific value from the list of valid values by clicking on the ellipsis symbol at the end of the field. Either scroll down the alphabetic list of code value descriptions to select the value you want, or type the first few letters of the code's description so that the alphabetic list scrolls to select the entry you want.</p>
ISUP called address prefix	Change	<p>This field is used only for long-distance calls in Canada that are routed over ISUP trunks, and is not required for deployments elsewhere. Specifies a prefix to be added to the called number in the ISUP IAM message. This is a 4-character string in which the first character is a letter A - F and the remaining characters are letters A-F or numbers 0 - 9. Leaving this field blank indicates that no prefix is to be included. Typical values are D081 for 1+10D dialed long distance calls, D138 for direct dialed international calls, and D022 for 1-600-XXX-XXXX calls.</p>

Parameter	Access	Description
Calling category	Change	<p>The type of call as indicated by the Calling Party Category parameter in the ISUP signaling flows. Values:</p> <ul style="list-style-type: none">• Unknown (default) This value indicates that the ISUP signaling parameter explicitly states the category as unknown.• Ordinary calling subscriber• Calling subscriber with priority• Operator• Payphone• Test call• Emergency• High priority emergency• National Security and Emergency Preparedness (NS/EP)• OSS operator (UK only)• Admin Diversion - ordinary (UK only)• Admin Diversion - ordinary with priority (UK only)• Admin Diversion - payphone (UK only)• Admin Diversion - payphone with priority (UK only)• Other This value indicates a calling category that the MetaSwitch NE does not recognize.
Default carrier identification parameter	Change	<p>The Carrier Identification Parameter (CIP) to be used for tests in this group. You can override this for a specific test if necessary. Specify the CIP as a 4-digit number (with leading zeros if necessary). To run the tests with no CIP, leave this field blank.</p>

Parameter	Access	Description
Charge number (ANI) present	Change	Specifies whether a charge number (ANI) is associated with the Routing request. Values: <ul style="list-style-type: none">• True• False (default) To indicate a zero-length ANI, set this parameter to True and leave the Charge number (ANI) field blank.
Charge number (ANI)	Change	Specifies the charge number (ANI) associated with the Routing request. This is a string of digits 0 - 9. To indicate a zero-length ANI, set Charge number (ANI) present to True and leave this field blank.
Bearer capability	Change	Specifies the bearer capability associated with the Routing request. Values: <ul style="list-style-type: none">• Speech (default)• 3.1kHz audio• 64kbps data• 64kbps restricted• 56kbps data
Originating exchange address	Change	Specifies the originating exchange address (a 10-digit numeric string) associated with the Routing request. The use of this parameter depends on the Media Channel type: <ul style="list-style-type: none">• For ISUP or SIP-T, this corresponds to the Jurisdiction parameter.• For MF, this is the originating LRN.• For ISDN or Basic SIP, this parameter is not used. The default is no address present.
Ported number	Change	Specifies the ported number associated with the Routing request. This is a 10-digit string of digits 0 - 9, or blank (the default) to specify no ported number.

Parameter	Access	Description
LNP lookup performed	Change	Specifies whether an LNP lookup is to be performed as part of the Routing request. Values: <ul style="list-style-type: none">• True• False (default)
Release control mode	Change	Specifies the release control mode associated with the Routing request; which party is responsible for releasing the call. Values: <ul style="list-style-type: none">• Calling party (default)• Called party
Dialed prefix	Change	Specifies the dialed prefix associated with the Routing request. Values: <ul style="list-style-type: none">• Unknown (default)• 1+• 0+• 0-• None
User defined MF call type	Change	Indicates the User defined MF call type associated with the Routing request. Specify the call type as an integer value in the range 0 - 4294967295.
Authorization Code - Code and PIN	Change	Indicates the authorization code and PIN, if any, associated with the Routing request. Specify the authorization code as a string of numeric digits, as it would be provided by the subscriber. If a PIN is required, append the 4 digits of the PIN to the end of the authorization code (without any spaces or other characters in between the code and PIN).
Authorization Code - Final Destination Number	Change	If the Routing request requires an authorization code followed by the final destination number, specify the final destination number (as a full directory number) in this field.

Parameter	Access	Description
Included media channels - media channels included	Change	<p>Specifies whether to run the test as though not all of the configured media channels are available. For example, you can use this field to simulate running the test in Emergency Standalone mode, in which only MF and SIP trunks connected to the Media Gateway in the specified ESA Protection Domain are available.</p> <p>Values:</p> <ul style="list-style-type: none"> • All (default) Any configured media channel can be used in the test. • Specified Only the media channels specified in the following Included media channels - media channel fields can be used in the test. • All except specified Any media channel can be used in the test except for those specified in the following Included media channels - media channel fields. • None No media channel can be used in the test. It will complete successfully only if it is to a number on the switch and does not require trunk routing. <p>If this field is set to Specified or All except specified, you must set at least one of the following Included media channels - media channel fields to indicate one or more channels to be included or excluded.</p> <p>If you run a test in this group and routing cannot be completed using the media channels that are permitted by the setting of these fields, the test will be marked as failed.</p>

Parameter	Access	Description
Included media channels - media channel 1	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. To remove the selected channel or trunk so that it is no longer included or excluded, select None .
Included media channels - media channel 2	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 3	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 4	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .

Parameter	Access	Description
Included media channels - media channel 5	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 6	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 7	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 8	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .

Parameter	Access	Description
Included media channels - media channel 9	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 10	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running tests in this group. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - simulated incoming release cause	Change	<p>Specifies whether to run the test as though it is a re-routing attempt because an earlier attempt to route the call over an ISUP or ISDN trunk failed. In general you should use this field in conjunction with the earlier Included media channels fields to exclude the trunk on which the earlier routing attempt would have failed.</p> <p>The valid values for this field, except for None, are a subset of those defined in Q.850; the other values defined in Q.850 identify release causes for which re-routing is not appropriate, or are not appropriate to ISUP or ISDN trunks.</p> <p>Values:</p> <ul style="list-style-type: none">• None Run the test as though there is no release cause specified (for example on the first pass through routing).• 2 No route to specified transit network (national use)• 3 No route to destination• 34 No circuit / channel available• 41 Temporary failure• 42 Switching equipment congestion

Parameter	Access	Description
		<ul style="list-style-type: none"> • 43 Access information discarded • 44 Requested circuit / channel not available • 46 Precedence call blocked • 47 Resource unavailable, unspecified • 58 Bearer capacity not presently available • 62 Inconsistency in outgoing information element • 63 Service or option not available, unspecified • 65 Bearer capability not implemented • 69 Requested facility not implemented • 70 Only restricted digital info bearer capability available • 79 Service option not implemented, unspecified • 88 Incompatible destination • 95 Invalid message, unspecified • 97 Message type non-existent or not implemented • 99 Info element / parameter non-existent or not implemented • 102 Recovery on timer expiry • 103 Parameter non-existent or not implemented - passed on • 111 Protocol error, unspecified • 127 Interworking, unspecified

Parameter	Access	Description
Included media channels - simulate media channels online - default	Change	<p>Specifies whether the status of each Media Channel is checked when a child Route Verification Test is run. You can override this for a specific test if necessary. Values:</p> <ul style="list-style-type: none"> • True The status of each Media Channel is not checked - all channels are assumed to be online. • False (default) A Media Channel can be used for the test only if it is online. <p>Regardless of the setting of this field, the test still includes other admission control checks: for example, the Media Channel must exist, have suitable bearer capabilities, be uncongested, and support outgoing calls.</p>
Number of tests	Read only	The number of Route Verification Test objects that are children of this Test Group.
Group test status	Read only	<p>The progress or outcome of the last group test executed for this test group. Values:</p> <ul style="list-style-type: none"> • Not run • In progress • Complete • Canceled • Canceling <p>If you have changed the value of one or more fields in this object since the last test was run, this field is set to Not run because no tests have been executed since the current field values were set.</p>
Number of tests executed	Read only	<p>The number of child RVT tests that have been completed during the current, most recently completed, or most recently canceled group test.</p> <p>If you have changed the value of one or more fields in this object since the last test was run, this field does not appear because no tests have been executed since the current field values were set.</p>

Parameter	Access	Description
Number of tests succeeded	Read only	The number of child RVT tests that completed successfully during the current, most recently completed, or most recently canceled group test. If you have changed the value of one or more fields in this object since the last test was run, this field does not appear because no tests have been executed since the current field values were set.
Number of tests failed	Read only	The number of child RVT tests that did not complete successfully during the current, most recently completed, or most recently canceled group test. If you have changed the value of one or more fields in this object since the last test was run, this field does not appear because no tests have been executed since the current field values were set.
Expected results - expected result	Change	Specifies whether you expect tests in this group to succeed or fail, and the failure mode if appropriate. Values: <ul style="list-style-type: none"> • None (default) • Succeeded • Identified Call Service access code • Failed - number validation • Failed - routing • Called number not found • Query failed

Parameter	Access	Description
Expected results - expected destination	Change	<p>This field appears only if Expected results - expected result is Succeeded. Specifies the destination or range of destinations to which you expect tests in this group to route. Values:</p> <ul style="list-style-type: none">• Any media channel or on-switch subscriber (default) The test should be regarded as passed regardless of the chosen destination.• One of specified media channels The test should be regarded as passed only if it routes to a media channel specified in the following Expected results - media channel fields.• Any media channel except specified The test should be regarded as passed if it does not to a media channel specified in the following Expected results - media channel fields.• On-switch subscriber The test should be regarded as passed only if it routes to a subscriber on this switch.
Expected results - media channel 1	Change	<p>This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified. A media channel considered to be valid or not valid for tests in this group. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. To remove the selected channel or trunk so that it is no longer considered to be valid or not valid, select None.</p>

Parameter	Access	Description
Expected results - media channel 2	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .
Expected results - media channel 3	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .
Expected results - media channel 4	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .
Expected results - media channel 5	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .

Parameter	Access	Description
Expected results - media channel 6	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .
Expected results - media channel 7	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .
Expected results - media channel 8	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .
Expected results - media channel 9	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .

Parameter	Access	Description
Expected results - media channel 10	Change	This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for tests in this group. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected results - media channel 1 .
Expected results - cause of failure	Change	This field appears only if Expected results - expected result is Failed - number validation or Failed - routing . The expected cause for either the number validation or routing failure. Values: <ul style="list-style-type: none">• None• Incomplete digits• Address incomplete• Configuration inconsistent• Incomplete digit map• Number validation failed• Routing failed• Address not valid• Transit not valid• No route to address• No route to transit• Maximum number of routes tried• No route to address (congestion)• No route to transit (congestion)• LNP call misrouted• Unallocated number• Internal routing error• Temporary failure• Resource shortage• Call rejected
Expected results - number of validated tests not yet run	Read only	The number of child RVT tests for which an expected result is defined that have not been run since their configuration parameters were last changed.

Parameter	Access	Description
Expected results - number of validated tests passed	Read only	The number of child RVT tests for which an expected result is defined that have been run and produced the expected result.
Expected results - number of validated tests failed	Read only	The number of child RVT tests for which an expected result is defined that have been run and did not produce the expected result.
Diagnostics - logging - log level	Change	Specifies the level of logs recorded for this object. Logs with a priority equal to or greater than the priority specified are recorded. Set to Default level to use the system-wide default level. Values: <ul style="list-style-type: none">• Level 10 (diagnostics)• Level 20 (verbose statistics)• Level 30 (verbose operational)• Level 40 (statistics)• Level 50 (audit)• Level 60 (operational)• Level 70 (unexpected)• Level 80 (error)• Level 90 (fatal)• Default level (default)
Diagnostics - API trace - trace tag	Change	An optional text string inserted into API tracing and PD logging for this object. (This string can include accented / international characters as defined in ISO 8859-1.) If you want to filter on this tag in the craft interface, do not include spaces or any of the characters ^ \ \$ * + ? () , . ` ` " [] { }.
Export - number of objects exported	Read only	The total number of objects (including child objects) written to the export file so far in the current or most recent export operation.

Parameter	Access	Description
Export - status	Read only	<p>The status of the current or most recent export operation, if any. Values:</p> <ul style="list-style-type: none">• None No export has been attempted. Use the export pushbutton to start it.• In progress Export is in progress. Do not attempt to access the export file until the status has changed to Succeeded.• Succeeded Export completed successfully.• Failed Export failed. Check the Export - log correlator field for more details.• Partially failed A field in the configuration of the exported object or one of its child objects was not valid. Typically this is because a referenced object has been deleted. Either check and correct the configuration before retrying the export, or correct the error in the exported file before attempting to re-import it.
Export - file	Change	<p>The name of the text file (in the EMS User's home directory on the EMS Server) to which configuration information for this object will be exported. The maximum length of the filename is 32 characters.</p>
Export - log correlator	Read only	<p>If the export status is Failed, this field contains a correlator for the log message that contains details of the failure. Click on the 'go to log' button next to this field to jump to this message in the EMS log viewer window.</p>
Export - correlator metaswitch	Read only	<p>If the export status is Failed, this field contains the name of the EMS Server or MetaSwitch Network Element that generated the failure log. You may need this information to find the log in the EMS log viewer window.</p>

Parameter	Access	Description
Requested status	Read only	Specifies whether an administrator has attempted to enable the Route Verification Test Group. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of the Route Verification Test object Group. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

4.2.4 Trunk Route Verification Test

The Trunk Route Verification Test object is a child of a Route Verification Test Group object.

Each Trunk Route Verification Test simulates the validation and routing of an incoming call received over a trunk from a remote exchange.

Most of the modifiable fields in this object are also included in the parent RVT Group object, and the default values are taken from the settings in the parent object. You do not need to set these fields explicitly unless you want to use different values from those in the parent RVT Group. The only parameters that you need to set are the parameters specific to a particular test, such as the telephone number to be tested.

The **Test result** field and subsequent fields, which report the outcome of the test, are valid only after the test has been run. To run the test, click on the 'Run test' pushbutton.

- The **Test result** field indicates the status of the last test run. Note that if any of the configuration fields have been modified since the last test was run, this field will be set to **Not yet run**.
- Many of the subsequent fields report attributes that may have been set during number validation or routing. If one or more of these attributes were not explicitly set, the corresponding fields are left blank.

The **Expected result** fields allow you to specify the results that you expect to get when running this test. If you configure an expected result, the operational status symbol next to this object in the EMS Tree View provides a quick view of whether the last run of the test was as expected:

- A green "play" triangle indicates that the test ran as expected.
- A yellow exclamation mark overlaid on the green triangle indicates that the test has not been run since its configuration was last changed.
- A red exclamation mark overlaid on the green triangle indicates that the test has been run but the results were not as expected.



You can change the values of parameters in this object at any time. However, if the test is running, and you change a parameter that could affect the results, the test is canceled.

Actions

- | | | |
|----------|--------------------|--------------|
| ✓ Create | ✓ Enable | ✗ Activate |
| ✓ Delete | ✓ Disable | ✗ Deactivate |
| ✓ Apply | ✗ Reset Statistics | ✓ Refresh |
| ✗ Import | ✗ Export | ✓ Output |

Object-Specific Actions

Run test To run a Trunk Route Verification Test, click on the 'Run test' pushbutton. Note that this action is not available when the object is disabled.

Parameter	Access	Description
Test name	Change	Unique user-friendly name identifying the test. Specify a name of up to 64 characters.
Called number	Change	The called number to set on messages used in this test. This field can include digits 0 - 9 and/or the characters # and *.
Called address scope	Change	The called address scope to set on messages used in this test. Values: <ul style="list-style-type: none"> • Unknown (default) • International • National • Network specified • Subscriber • Abbreviated • Reserved 1 • 950 Plus • No number • UK specific
Trunk Routing Config Set	Change	Config Set over which the test should be run. Choose Use default to use the default value specified in the parent RVT Group, or choose Specify value and select from the list of active Config Sets.
Remote media channel	Change	Remote media channel to be used as a match attribute in routing tables. Click on the ellipsis symbol to the right of this field to choose MF, ISDN, ISUP or SIP, then follow the dialogs to select the appropriate channel or trunk from the list. Media channels or ISDN PRIs that support only outgoing calls cannot be used to match this action and do not appear in the list.

Parameter	Access	Description
SIP type	Change	This field appears only if Remote media channel specifies a SIP trunk. Set this field to indicate whether the trunk supports Basic SIP or SIP-T (to match the configuration of the selected trunk). Values: <ul style="list-style-type: none">• Basic SIP (default)• SIP-T
Controlling ESA Protection Domain	Change	Specifies whether this test is to simulate operation in Emergency Standalone (ESA) mode, and if so the ESA Protection Domain from which the test is to simulate running. Select from the drop-down list of ESA Protection Domains, or select None: Main Call Agent in control to run the test normally (not in ESA mode).
Calling number ANI II digits	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk. The ANI II digits present for the calling number. This field is not mandatory, but if specified should be two digits long. If this field is not completed, the default value, 00, is used.
Operator hold allowed	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI . Specifies whether operator hold is allowed on the call. Values: <ul style="list-style-type: none">• True• False

Parameter	Access	Description
Priority call	Change	<p>This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI .</p> <p>Indicates whether the call requires priority handling. Values:</p> <ul style="list-style-type: none">• True• False
Use TCAP if required	Change	<p>This field describes whether TCAP queries are allowed for this routing test. If TCAP queries are required, and this field is set to False, the test result will be Query failed, and the TCAP Queries – Local Number Portability and TCAP Queries – Toll Free Lookup fields will give more detailed information describing exactly what query was required. Values:</p> <ul style="list-style-type: none">• True• False (default)
Ignore Terminating Application Server	Change	<p>Specifies whether the call setup request should ignore the subscriber's Terminating Application Server, if one is configured, or should include routing to it. Values:</p> <ul style="list-style-type: none">• True Generate the call setup request without routing to the server.• False Include routing to the server as part of the generated call setup request.
Incoming trunk group ID	Change	<p>The Trunk Group ID of the incoming media channel.</p> <p>This field must be set if Use TCAP if required is set to true. If Use TCAP if required is set to false, then this value makes no difference to the result of the test. Range: 0 – 9999.</p>

Parameter	Access	Description
Calling party number	Change	This field is hidden if Remote media channel specifies an MF Media Channel. The calling number on the signaling message associated with the Routing request. Specify the number as a string of digits 0-9, or leave this field blank to indicate that no number is to be provided. This field is required if a TCAP query is to be performed for local number portability or toll free lookup as part of this test, and must be set if Use TCAP if required is set to True .
Calling number scope	Change	This field is hidden if Remote media channel specifies an MF Media Channel. The area within which the calling number is unique. Values: <ul style="list-style-type: none">• Unknown• International• National• Subscriber
Calling number presentation restricted	Change	This field is hidden if Remote media channel specifies an MF Media Channel. Specifies any restrictions on presenting the calling number to the called subscriber. Values: <ul style="list-style-type: none">• Allowed• Restricted• Number not available• No indication
Test call	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI. Indicates whether the call is a test call. Values: <ul style="list-style-type: none">• True• False

Parameter	Access	Description
Operator call	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI . Specifies whether the routing request is for an operator call. Values: <ul style="list-style-type: none">• True• False
Transit Network ID	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk. Identifier for the transit network to which the call should be routed.
Echo cancellation	Change	This field is hidden if Remote media channel specifies an MF Trunk. Specifies the echo cancellation requirements associated with the Routing request. Values: <ul style="list-style-type: none">• None• Required• Preferred
User defined MF call type	Change	Specifies the User defined MF call type associated with the Routing request. Specify the call type as an integer value in the range 0 - 4294967295.
ISUP called address prefix	Change	This field is used only for long-distance calls in Canada that are routed over ISUP trunks, and is not required for deployments elsewhere. Specifies a prefix to be added to the called number in the ISUP IAM message. This is a 4-character string in which the first character is a letter A - F and the remaining characters are letters A-F or numbers 0 - 9. Leaving this field blank indicates that no prefix is to be included. Typical values are D081 for 1+10D dialed long distance calls, D138 for direct dialed international calls, and D022 for 1-600-XXX-XXXX calls.

Parameter	Access	Description
Calling category	Change	<p>This field appears only if the Remote media channel field specifies an ISUP Media Channel, or if the Remote media channel and SIP type fields specify a SIP-T Trunk. The type of call as indicated by the Calling Party Category parameter in the ISUP signaling flows. Values:</p> <ul style="list-style-type: none">• Unknown This value indicates that the ISUP signaling parameter explicitly states the category as unknown.• Ordinary calling subscriber• Calling subscriber with priority• Operator• Payphone• Test call• Emergency• High priority emergency• National Security and Emergency Preparedness (NS/EP)• OSS operator (UK only)• Admin Diversion - ordinary (UK only)• Admin Diversion - ordinary with priority (UK only)• Admin Diversion - payphone (UK only)• Admin Diversion - payphone with priority (UK only)• Other This value indicates a calling category that the MetaSwitch NE does not recognize.

Parameter	Access	Description
Carrier identification parameter	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI . The Carrier Identification Parameter (CIP) to be used for this test. Choose Use default to use the default value specified in the parent RVT Group, or choose Specify value and specify the CIP as a 4-digit number (with leading zeros if necessary). To run the test with no CIP (even if one was specified in the parent RVT Group), choose Specify value and leave this field blank.
Charge number (ANI) present	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI . Specifies whether a charge number (ANI) is associated with the Routing request. Values: <ul style="list-style-type: none">• True• False To indicate a zero-length ANI, set this parameter to True and leave the Charge number (ANI) field blank.
Charge number (ANI)	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI . Specifies the charge number (ANI) associated with the Routing request. This is a string of digits 0 - 9. To indicate a zero-length ANI, set Charge number (ANI) present to True and leave this field blank.

Parameter	Access	Description
Bearer capability	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an MF Media Channel. Specifies the bearer capability associated with the Routing request. Values: <ul style="list-style-type: none">• Speech• 3.1kHz audio• 64kbps data• 64kbps restricted• 56kbps data
Originating exchange address	Change	This field does not appear if the Remote media channel and SIP type fields specify a Basic SIP Trunk, or if the Remote media channel field specifies an ISDN PRI. Specifies the originating exchange address (a 10-digit numeric string) associated with the Routing request. The use of this parameter depends on the Media Channel type: <ul style="list-style-type: none">• For ISUP or SIP-T, this corresponds to the Jurisdiction parameter.• For MF, this is the originating LRN. The default is no address present.
Ported number	Change	This field appears only if the Remote media channel and SIP type fields specify a SIP-T Trunk, or if the Remote media channel field specifies an ISUP Media Channel. Specifies the ported number associated with the Routing request. This is a 10-digit string of digits 0 - 9.
LNP lookup performed	Change	This field appears only if the Remote media channel and SIP type fields specify a SIP-T Trunk, or if the Remote media channel field specifies an ISUP Media Channel. Specifies whether an LNP lookup was performed in any part of the network before the call reached the MetaSwitch NE. Values: <ul style="list-style-type: none">• True• False

Parameter	Access	Description
Release control mode	Change	This field is hidden if Remote media channel specifies a Media Channel that is not MF. Specifies the release control mode associated with the Routing request: which party is responsible for releasing the call. Values: <ul style="list-style-type: none">• Calling party• Called party
Dialed prefix	Change	This field appears only if the Remote media channel and SIP type fields specify a SIP-T Trunk, or if the Remote media channel field specifies an ISUP Media Channel. Specifies the dialed prefix associated with the Routing request. Values: <ul style="list-style-type: none">• Unknown• 1+• 0+• 0-• None
Authorization Code - Code and PIN	Change	Indicates the authorization code and PIN, if any, associated with the Routing request. Specify the authorization code as a string of numeric digits, as it would be provided by the subscriber. If a PIN is required, append the 4 digits of the PIN to the end of the authorization code (without any spaces or other characters in between the code and PIN).
Authorization Code - Final Destination Number	Change	If the Routing request requires an authorization code followed by the final destination number, specify the final destination number (as a full directory number) in this field.

Parameter	Access	Description
Included media channels - media channels included	Change	<p>Specifies whether to run the test as though not all of the configured media channels are available. For example, you can use this field to simulate running the test in Emergency Standalone mode, in which only MF and SIP trunks connected to the Media Gateway in the specified ESA Protection Domain are available.</p> <p>Values:</p> <ul style="list-style-type: none"> • All (default) Any configured media channel can be used in the test. • Specified Only the media channels specified in the following Included media channels - media channel fields can be used in the test. • All except specified Any media channel can be used in the test except for those specified in the following Included media channels - media channel fields. • None No media channel can be used in the test. It will complete successfully only if it is to a number on this switch and does not require trunk routing. <p>If this field is set to Specified or All except specified, you must set at least one of the following Included media channels - media channel fields to indicate one or more channels to be included or excluded.</p> <p>If you run this test and routing cannot be completed using the media channels that are permitted by the setting of these fields, the test will be marked as failed.</p>

Parameter	Access	Description
Included media channels - media channel 1	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. To remove the selected channel or trunk so that it is no longer included or excluded, select None .
Included media channels - media channel 2	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 3	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 4	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .

Parameter	Access	Description
Included media channels - media channel 5	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 6	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 7	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 8	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .

Parameter	Access	Description
Included media channels - media channel 9	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 10	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - simulated incoming release cause	Change	<p>Specifies whether to run the test as though it is a re-routing attempt because an earlier attempt to route the call over an ISUP or ISDN trunk failed. In general you should use this field in conjunction with the earlier Included media channels fields to exclude the trunk on which the earlier routing attempt would have failed.</p> <p>The valid values for this field, except for None and Use values on Test Group, are a subset of those defined in Q.850; the other values defined in Q.850 identify release causes for which re-routing is not appropriate, or are not appropriate to ISUP or ISDN trunks. Values:</p> <ul style="list-style-type: none">• None Run the test as though there is no release cause specified (for example on the first pass through routing).• 2 No route to specified transit network (national use)• 3 No route to destination• 34 No circuit / channel available• 41 Temporary failure• 42 Switching equipment congestion

Parameter	Access	Description
		<ul style="list-style-type: none"> • 43 Access information discarded • 44 Requested circuit / channel not available • 46 Precedence call blocked • 47 Resource unavailable, unspecified • 58 Bearer capacity not presently available • 62 Inconsistency in outgoing information element • 63 Service or option not available, unspecified • 65 Bearer capability not implemented • 69 Requested facility not implemented • 70 Only restricted digital info bearer capability available • 79 Service option not implemented, unspecified • 88 Incompatible destination • 95 Invalid message, unspecified • 97 Message type non-existent or not implemented • 99 Info element / parameter non-existent or not implemented • 102 Recovery on timer expiry • 103 Parameter non-existent or not implemented - passed on • 111 Protocol error, unspecified • 127 Interworking, unspecified • Use values on Test Group Use the simulated incoming release cause, if any, specified on the parent Route Verification Test Group.

Parameter	Access	Description
Included media channels - simulate media channels online	Change	<p>Specifies whether the status of each Media Channel is checked when the test is run. Choose Use default or specify a value:</p> <ul style="list-style-type: none"> • True The status of each Media Channel is not checked - all channels are assumed to be online. • False A Media Channel can be used for the test only if it is online. <p>Regardless of the setting of this field, the test still includes other admission control checks: for example, the Media Channel must exist, have suitable bearer capabilities, be uncongested, and support outgoing calls.</p>
Test result	Read only	<p>This field is valid only after the test has been run. To run the test, click on the 'Run test' pushbutton. This field indicates the status of the last test run. Note that if any of the previous fields have been modified since the last test was run, this field will be set to Not yet run. Values:</p> <ul style="list-style-type: none"> • Not yet run The test has not been run yet, or one of more of the previous fields has changed since the test was last run. • Result pending The test is in progress. • Succeeded The test has run, and both the number validation and the routing succeeded. • Identified Call Service access code The test has run, and the routing component has identified the number dialed as a call service access code. • Not able to run The test was not able to run because the routing component is not in a suitable state to route requests. • Failed – number validation The test was run and number validation failed.

Parameter	Access	Description
		<ul style="list-style-type: none">• Failed – routing The test was run and routing failed.• Called number not found The routing component has determined that the call should be routed to a subscriber on this switch, but the subscriber does not exist.• System not fully active The test cannot be run because the system is not fully set up.• Query failed A TCAP query failed, or could not be made because Use TCAP if required was set to False.• Canceling The test is in the process of being canceled, either because an administrator used the "Cancel all tests" action in the parent Route Verification Test Group object or because one or more test values were changed.• Canceled The test was canceled.

Parameter	Access	Description
Cause of failure	Read only	<p>This field is valid only if Test result is set to Failed – number validation or Failed – routing. This field specifies the cause for either the number validation or routing failure. Values:</p> <ul style="list-style-type: none"> • None • Incomplete digits • Address incomplete • Configuration inconsistent • Incomplete digit map • Number validation failed • Routing failed • Address not valid • Transit not valid • No route to address • No route to transit • Maximum number of routes tried • No route to address (congestion) • No route to transit (congestion) • LNP call misrouted • Unallocated number • Internal routing error • Temporary failure • Resource shortage • Call rejected
Expected result - expected result	Change	<p>Specifies whether you expect this test to succeed or fail, and the failure mode if appropriate. Values:</p> <ul style="list-style-type: none"> • Use values on Test Group (default) Use the default Expected results values specified on the parent Route Verification Test Group. • None • Succeeded • Identified Call Service access code • Failed - number validation • Failed - routing • Called number not found • Query failed

Parameter	Access	Description
Expected result - expected destination	Change	<p>This field appears only if Expected result - expected result is Succeeded. Specifies the destination or range of destinations to which you expect this test to route. Values:</p> <ul style="list-style-type: none">• Any media channel or on-switch subscriber (default) The test should be regarded as passed regardless of the chosen destination.• One of specified media channels The test should be regarded as passed only if it routes to a media channel specified in the following Expected results - media channel fields.• Any media channel except specified The test should be regarded as passed if it does not to a media channel specified in the following Expected results - media channel fields.• On-switch subscriber The test should be regarded as passed only if it routes to a subscriber on this switch.
Expected result - media channel 1	Change	<p>This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified. A media channel considered to be valid or not valid for this test. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. To remove the selected channel or trunk so that it is no longer considered to be valid or not valid, select None.</p>

Parameter	Access	Description
Expected result - media channel 2	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected result - media channel 1 .
Expected result - media channel 3	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 4	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 5	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .

Parameter	Access	Description
Expected result - media channel 6	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 7	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 8	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 9	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .

Parameter	Access	Description
Expected result - media channel 10	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - cause of failure	Change	This field appears only if Expected result - expected result is Failed - number validation or Failed - routing . The expected cause for either the number validation or routing failure. Values: <ul style="list-style-type: none">• None• Incomplete digits• Address incomplete• Configuration inconsistent• Incomplete digit map• Number validation failed• Routing failed• Address not valid• Transit not valid• No route to address• No route to transit• Maximum number of routes tried• No route to address (congestion)• No route to transit (congestion)• LNP call misrouted• Unallocated number• Internal routing error• Temporary failure• Resource shortage• Call rejected

Parameter	Access	Description
Expected result - result as expected	Read only	This field does not appear if Expected result - expected result is None , or if it is Use values on Test Group and the parent Test Group's value is None . Indicates whether the result of the last run of this test matched the expected result. Values: <ul style="list-style-type: none"> • Yes • No • Not yet run to completion The test has not been run to completion since its configuration parameters were last changed.
Number validation – ANI II digits	Read only	The ANI II digits specified on the output from number validation.
Number validation – modified called number	Read only	The modified called number specified on the output from number validation.
Number validation – modified calling party number	Read only	The modified calling party number specified on the output from number validation.
Number validation – modified charge number	Read only	The modified charge number specified on the output from number validation.
Number validation – carrier selection method	Read only	The carrier selection method specified on the output from number validation. This indicates how the carrier for the call was selected; it is not included when a carrier is selected implicitly (800, 900-NXX, ...) rather than explicitly by the caller. Values: <ul style="list-style-type: none"> • Unspecified • Presubscribed • Presubscribed and input • Presubscribed, may have been input • Input

Parameter	Access	Description
Number validation – call hold allowed	Read only	Whether the output from number validation specifies that holding the call is allowed. Values: <ul style="list-style-type: none">• True• False
Number validation – release control mode	Read only	The release control mode for the call specified on the output from number validation. Values: Values: <ul style="list-style-type: none">• Calling party• Called party• Last party
Number validation – restricted line 950 call	Read only	Whether the output from number validation specifies that the call is to a 950-XXXX number from a restricted line. Values: <ul style="list-style-type: none">• True• False
Number validation – test call	Read only	Whether the output from number validation specifies that the call is a test call. Values: <ul style="list-style-type: none">• True• False
Number validation – tone or announcement ID	Read only	The tone or announcement ID specified on the output from number validation.
Number validation – tone or announcement parameter 1	Read only	The tone or announcement parameter 1 specified on the output from number validation.
Number validation – tone or announcement parameter 2	Read only	The tone or announcement parameter 2 specified on the output from number validation.
Number validation – Transit Network ID	Read only	The Transit Network ID specified on the output from Number validation.

Parameter	Access	Description
Number validation - echo cancellation	Read only	Whether the output from number validation specifies that echo cancellation is required for the call. Values: <ul style="list-style-type: none">• None• Preferred• Required
Number validation – user defined attribute 1 - 20	Read only	This field appears once for each User Defined Attribute that you have configured below the Trunk Routing and Policy Services object. The user defined attributes specified on the output from number validation.
Number validation - user defined MF call type	Read only	The User defined MF call type specified on the output from number validation.
Number validation – message billing index	Read only	The message billing index specified on the output from number validation.
Number validation – use Pseudo ANI (pANI)	Read only	Whether the output from number validation specifies that the calling party fields in outgoing messages contain the Charge Number from the original call (instead of the Calling Party Number). Values: <ul style="list-style-type: none">• Never• Only when no calling number• Always
Number validation – pseudo ANI egress signaling types	Read only	This field does not appear if Number validation - use Pseudo ANI (pANI) is Never . The types of outgoing signaling stack for which Pseudo ANI is to be used, as specified on the output from number validation. Values: <ul style="list-style-type: none">• ISUP• ISDN access• ISDN trunk• SIP access• SIP trunk• Analog

Parameter	Access	Description
Number validation – pseudo ANI presentation indicator	Read only	This field does not appear if Number validation - use Pseudo ANI (pANI) is Never . The presentation indicator to be used with Pseudo ANI, as specified on the output from number validation. Values: <ul style="list-style-type: none">• Restricted (default)• Available
Number validation – billing call type	Read only	The billing call type attribute, if any, specified on the output from number validation. Values: <ul style="list-style-type: none">• 1• 5• 6• 9• 33• 47• 88• 110• 119• 131• 132• 134• 141• 142• 710• 711• 720• 721• 800 - 999

Parameter	Access	Description
Number validation – billing structure code	Read only	The billing structure code attribute, if any, specified on the output from number validation. Values: <ul style="list-style-type: none"> • 1 • 20 • 28 • 79 • 220 • 360 • 364 • 500 • 625 • 653
Number validation – override AIN billing	Read only	Whether the output from number validation specifies that the structure code and call type in AIN billing records for this call should be overridden with the configured values. Values: <ul style="list-style-type: none"> • Yes • No
Number validation - ISUP called address prefix	Read only	This field is used only for long-distance calls in Canada that are routed over ISUP trunks, and is not required for deployments elsewhere. Specifies the prefix, if any, added to the called number in the ISUP IAM message.

Parameter	Access	Description
Number validation - calling category	Read only	<p>The calling category, if any, specified on the output from number validation.</p> <p>Values:</p> <ul style="list-style-type: none">• Unknown This value indicates that the ISUP signaling parameter explicitly states the category as unknown.• Ordinary calling subscriber• Calling subscriber with priority• Operator• Payphone• Test call• Emergency• High priority emergency• National Security and Emergency Preparedness (NS/EP)• OSS operator (UK only)• Admin Diversion - ordinary (UK only)• Admin Diversion - ordinary with priority (UK only)• Admin Diversion - payphone (UK only)• Admin Diversion - payphone with priority (UK only)• Other This value indicates a calling category that the MetaSwitch NE does not recognize.
Number validation - FGD carrier ID	Read only	<p>The 4-digit carrier ID, if any, specified on the output from number validation.</p>

Parameter	Access	Description
Number validation - called address scope	Read only	The called address scope, if any, specified on the output from number validation. Values: <ul style="list-style-type: none">• Unknown• International• National• Network specified• Subscriber• Abbreviated• Reserved 1• 950 Plus• No number• UK specific
Number validation – ANI Screening lookup type	Read only	The type of ANI Screening lookup, if any, specified on the output from number validation. Values: <ul style="list-style-type: none">• None No ANI Screening lookup.• Lookup on carrier code (North America only) Check that the Transit Network ID associated with the call matches the on-switch carrier configured for the active Config Set, and if so perform an ANI Screening lookup using the configured ANI Screening Table.• Lookup in specific table Use the ANI Screening Table specified in Number validation - ANI Screening lookup table to perform the lookup (without checking the Transit Network ID).
Number validation - ANI Screening lookup table	Read only	This field applies only if Number validation - ANI Screening lookup type is set to Lookup in specific table . Specifies the ANI Screening Table to be used for the ANI Screening lookup.

Parameter	Access	Description
Number validation – Number type for ANI lookup	Read only	<p>The ANI lookup number type, if any, specified on the output from number validation. This identifies the type of number associated with the call that should be looked up in an ANI Screening lookup. If this number is not available, the call is processed as if no match could be found. Values:</p> <ul style="list-style-type: none">• Charge number Use the Charge Number for lookup.• Charge number preferred Use the Charge Number for lookup if it is available; use the Calling Party Number if this is the only number available.• Calling party number Use the Calling Party Number for lookup.• Calling party number preferred Use the Calling Party Number for lookup if it is available; use the Charge Number if this is the only number available.
Number validation – Number used for ANI lookup	Read only	<p>The number that was used for ANI lookup, if any, specified on the output from number validation.</p>
Number validation – Matched ANI Screening Entry type	Read only	<p>The type of ANI Screening match, if any, specified on the output from number validation. Values:</p> <ul style="list-style-type: none">• Not matched No ANI Screening Entry was matched.• Allowed The call matched an Allowed ANI Screening Entry.• Denied The call matched a Denied ANI Screening Entry.
Number validation – Matched ANI Screening Entry	Read only	<p>This field does not appear if Number validation - Matched ANI Screening Entry type is set to Not matched. The name of the ANI Screening Entry that was matched in number validation.</p>

Parameter	Access	Description
Number validation - Authorization Code Operation	Read only	<p>The authorization code operation required for this call, if any, determined in number validation. Values:</p> <ul style="list-style-type: none">• None No authorization code is required.• No Validation The authorization code specified in Number Validation - Authorization Code Prefix is used in billing records for the call. The subscriber is not required to dial an authorization code to make the call.• On-Switch Calling Card / Hotline The subscriber must dial an authorization code to make the call, and the following fields define how this code is validated.
Number validation - Authorization Code Table	Read only	<p>This field appears only if Number validation - Authorization Code Operation is visible and set to On-Switch Calling Card / Hotline. The authorization code table used for this call, if any, determined in number validation.</p>
Number validation - Valid Authorization Codes	Read only	<p>This field applies only if Number validation - Authorization Code Operation is visible and set to On-Switch Calling Card / Hotline. The authorization code matching required for this call, if any, determined in number validation. Values:</p> <ul style="list-style-type: none">• Any code in table The subscriber can use any authorization code in the table specified by Number Validation - Authorization Code Table.• Specific code The subscriber must use a specific authorization code.

Parameter	Access	Description
Number validation - Authorization Code Prefix	Read only	<p>The authorization code prefix required for this call, if any, determined in number validation. The use of this field depends on the setting of Number validation - Authorization Code Operation, as follows.</p> <ul style="list-style-type: none">• If Authorization Code Operation is None, this field does not appear.• If Authorization Code Operation is No Validation, this field contains the complete authorization code that is added to billing records for the call.• If Authorization Code Operation is On-Switch Calling Card / Hotline, this field defines an optional prefix for the authorization code. The complete code that is checked against authorization code tables consists of this prefix followed by the code dialed by the subscriber. For example, if the authorization code is the subscriber's home directory number (validated by a PIN), this field could contain the NPA code so that the subscriber need only enter the 7D number.
Number validation – maximum call duration	Read only	<p>The maximum call duration, if any, specified on the output from number validation.</p>
Number validation – outgoing release cause	Read only	<p>The outgoing release cause, if any, specified on the output from number validation. For a full list of the valid values, see the Attribute value - outgoing ISUP/ISDN release cause field in the Attribute Entry object.</p>
Routing – test call	Read only	<p>Whether the output from the routing step specifies that the call is a test call. Values:</p> <ul style="list-style-type: none">• True• False
Routing – modified called number	Read only	<p>The modified called number specified on the output from the routing step.</p>

Parameter	Access	Description
Routing – modified calling party number	Read only	The modified calling party number specified on the output from the routing step.
Routing – modified charge number	Read only	The modified charge number specified on the output from the routing step.
Routing – operator call	Read only	Whether the output from the routing step specifies that the call is an operator call. Values: <ul style="list-style-type: none">• True• False
Routing – tone or announcement ID	Read only	The tone or announcement ID specified on the output from the routing step.
Routing – tone or announcement parameter 1	Read only	The tone or announcement parameter 1 specified on the output from the routing step.
Routing – tone or announcement parameter 2	Read only	The tone or announcement parameter 2 specified on the output from the routing step.
Routing – Transit Network ID	Read only	The Transit Network ID specified on the output from the routing step.
Routing – media channel	Read only	This field appears only if the routing step was successful and the call is not routed to a subscriber on this switch. Specifies the media channel over which the call is to be routed (MF Trunk, ISUP trunk, ISDN PRI, or SIP trunk), or specifies Announcement service if the call is routed to an announcement.

Parameter	Access	Description
Routing – on-switch subscriber type	Read only	<p>This field appears only if the routing step was successful and the call is routed to another subscriber on this switch. Specifies the type of subscriber to which the call is to be routed. Values:</p> <ul style="list-style-type: none">• Individual Line• Business Group• Voicemail SMDI voicemail system• PBX• SIP Application Server or SIP voicemail system
Routing – on-switch subscriber number	Read only	<p>This field appears only if the routing step was successful and the call is routed to another subscriber on this switch. Specifies the directory number to which the call is to be routed.</p>
Routing - echo cancellation	Read only	<p>Whether the output from the routing step specifies that echo cancellation is required for the call. Values:</p> <ul style="list-style-type: none">• None• Preferred• Required
TCAP queries – Local Number Portability	Read only	<p>The result of any TCAP queries for local number portability. Values:</p> <ul style="list-style-type: none">• Failed – resource allocation failure• Failed - parameter information unavailable• Failed – TCAP failure• Not required• Successful (no Automatic Code Gapping)• Successful (encountered Automatic Code Gapping)• Not attempted – restriction on current call• Not attempted – Automatic Code Gapping controls in place• Failed – bad response• Failed – timeout

Parameter	Access	Description
TCAP queries – Toll Free Lookup	Read only	The result of any TCAP queries for toll free lookup. Values: <ul style="list-style-type: none">• Failed – resource allocation failure• Failed - parameter information unavailable• Failed – TCAP failure• Not required• Successful (no Automatic Code Gapping)• Successful (encountered Automatic Code Gapping)• Not attempted – restriction on current call• Not attempted – Automatic Code Gapping controls in place• Failed – bad response• Failed – timeout
Routing - FGD carrier ID	Read only	The 4-digit carrier ID, if any, specified on the output from routing.
Routing - charge number (ANI) present	Read only	Indicates whether the output from routing specified that a charge number (ANI) was present. Values: <ul style="list-style-type: none">• True• False
Routing - charge number (ANI)	Read only	Indicates the charge number (ANI), if any, specified on the output from routing. This is a string of digits 0 - 9. If Charge number (ANI) present is True but this field is blank, this indicates a zero-length ANI.
Routing - dialed prefix	Read only	Indicates the dialed prefix, if any, specified on the output from routing. Values: <ul style="list-style-type: none">• Unknown• 1+• 0+• 0–• None

Parameter	Access	Description
Routing - maximum call duration	Read only	The maximum call duration, if any, specified on the output from the routing step.
Diagnostics - logging - log level	Change	Specifies the level of logs recorded for this object. Logs with a priority equal to or greater than the priority specified are recorded. Set to Default level to use the system-wide default level. Values: <ul style="list-style-type: none"> • Level 10 (diagnostics) • Level 20 (verbose statistics) • Level 30 (verbose operational) • Level 40 (statistics) • Level 50 (audit) • Level 60 (operational) • Level 70 (unexpected) • Level 80 (error) • Level 90 (fatal) • Default level (default)
Diagnostics - API trace - trace tag	Change	An optional text string inserted into API tracing and PD logging for this object. (This string can include accented / international characters as defined in ISO 8859-1.) If you want to filter on this tag in the craft interface, do not include spaces or any of the characters ^ \ \$ * + ? () , . ` ` " [] { }.
Requested status	Read only	Specifies whether an administrator has attempted to enable the Trunk Route Verification Test. Values: <ul style="list-style-type: none"> • Enabled The object has been enabled. • Disabled The object has not been enabled or has been disabled.

Parameter	Access	Description
Actual status	Read only	Specifies the current status of the Trunk Route Verification Test object. Values: <ul style="list-style-type: none">• Enabled The object is enabled.• Disabled The object has not been enabled or has been disabled.

4.2.5 Subscriber Route Verification Test

The Subscriber Route Verification Test object is a child of an RVT Test Group object.

Each Subscriber Route Verification Test simulates the validation and routing of a call initiated by a subscriber on this switch dialing a number.

Most of the modifiable fields in this object are also included in the parent RVT Test Group object, and the default values are taken from the settings in the parent object. You do not need to set these fields explicitly unless you want to use different values from those in the parent RVT Test Group. The only parameters that you need to set are the parameters specific to a particular test, such as the telephone number to be tested.

The **Test result** field and subsequent fields, which report the outcome of the test, are valid only after the test has been run. To run the test, click on the 'Run test' pushbutton.

- The **Test result** field indicates the status of the last test run. Note that if any of the configuration fields have been modified since the last test was run, this field will be set to **Not yet run**.
- Many of the subsequent fields report attributes that may have been set during number validation or routing. If one or more of these attributes were not explicitly set, the corresponding fields are left blank.

The **Expected result** fields allow you to specify the results that you expect to get when running this test. If you configure an expected result, the operational status symbol next to this object in the EMS Tree View provides a quick view of whether the last run of the test was as expected:

- A green "play" triangle indicates that the test ran as expected.
- A yellow exclamation mark overlaid on the green triangle indicates that the test has not been run since its configuration was last changed.
- A red exclamation mark overlaid on the green triangle indicates that the test has been run but the results were not as expected.



You can change the values of parameters in this object at any time. However, if the test is running, and you change a parameter that could affect the results, the test is canceled.

Actions

✓ Create	✓ Enable	✗ Activate
✓ Delete	✓ Disable	✗ Deactivate
✓ Apply	✗ Reset Statistics	✓ Refresh
✗ Import	✗ Export	✓ Output

Object-Specific Actions

Run test To run a Subscriber Route Verification Test, click on the 'Run test' pushbutton. Note that this action is not available when the object is disabled. This will execute the **Route** action if **Use TCAP if required** is set to **True**. If **Use TCAP if required** is set to **False**, it will execute the **Route no TCAP** action.

Parameter	Access	Description
Test name	Change	Unique user-friendly name identifying the test. Specify a name of up to 64 characters.
Dialed number	Change	The number to simulate dialing. This field can include digits 0 - 9 and/or the characters # and *.
Trunk Routing Config Set	Change	Config Set over which the test should be run. Choose Use default to use the default value specified in the parent RVT Group, or choose Specify value and select from the list of active Config Sets.
Subscriber type	Change	Specifies whether the test is to simulate dialing from a configured subscriber's number or from a hypothetical subscriber. Choose Use default to use the default value specified in the parent RVT Group, or choose Specify value and select one of the following values: <ul style="list-style-type: none">• Configured• Hypothetical
Subscriber directory number	Change	This field is valid only if Subscriber type is Configured . Directory number of the subscriber from which to simulate dialing. Choose Use default to use the default value specified in the parent RVT Group, or choose Specify value if you want to override the default. To specify a value, either type in the number, or click on the ellipsis symbol to the right of this field to select from a list of configured subscriber lines' directory numbers.

Parameter	Access	Description
Charge number	Change	This field is valid only if Subscriber type is Hypothetical . The 10-digit directory number to which calls are billed, which can be different from the directory number if required. If this field is left blank, calls are billed to the subscriber's directory number.
Subscriber Group	Change	This field is valid only if Subscriber type is Hypothetical . Subscriber Group to which the hypothetical subscriber belongs. Select from the list of configured Subscriber Groups.
Billing type	Change	This field is valid only if Subscriber type is Hypothetical . The billing type for the hypothetical subscriber for local calls. Values: <ul style="list-style-type: none">• Flat rate billing• Message rate billing• FX rate billing
Long distance carrier ID	Change	This field is valid only if Subscriber type is Hypothetical . The long distance carrier ID used by default for the hypothetical subscriber. This field may be left blank if you wish to simulate a situation in which the subscriber has not subscribed to a long distance carrier.
IntraLATA carrier ID	Change	This field is valid only if Subscriber type is Hypothetical . The intraLATA carrier ID used by default for the hypothetical subscriber. This field may be left blank if you wish to simulate a situation in which the subscriber has not subscribed to an intraLATA carrier.
International carrier ID	Change	This field is valid only if Subscriber type is Hypothetical . The international carrier ID used by default for the hypothetical subscriber. This field may be left blank if you wish to simulate a situation in which the subscriber has not subscribed to an international carrier.

Parameter	Access	Description
Subscriber NV and routing attributes	Change	<p>This field is valid only if Subscriber type is Hypothetical. Subscriber routing attributes for the hypothetical subscriber. If required, select one or more of the following values:</p> <ul style="list-style-type: none">• Pre-paid / off-switch calling card subscriber• Fax / modem subscriber• Nomadic subscriber
Use TCAP if required	Change	<p>This field describes whether TCAP queries are allowed for this routing test. If TCAP queries are required, and this field is set to False, the test result will be Failed, and the TCAP Queries – Local Number Portability and TCAP Queries – Toll Free Lookup fields will give more detailed information describing exactly what query was required. Values:</p> <ul style="list-style-type: none">• True• False (default)
Ignore Originating Application Server	Change	<p>This field is valid only if Subscriber type is Configured. Specifies whether the call setup request should ignore the subscriber's Originating Application Server, if one is configured, or should include routing to it. Values:</p> <ul style="list-style-type: none">• True Generate the call setup request without routing to the server.• False Include routing to the server as part of the generated call setup request.
Ignore Terminating Application Server	Change	<p>Specifies whether the call setup request should ignore the subscriber's Terminating Application Server, if one is configured, or should include routing to it. Values:</p> <ul style="list-style-type: none">• True Generate the call setup request without routing to the server.• False Include routing to the server as part of the generated call setup request.

Parameter	Access	Description
Line Class Code 1 - 20	Change	<p>This field is valid only if Subscriber type is Hypothetical. It appears once for each Line Class Code that you have configured below the Trunk Routing and Policy Services object.</p> <p>The Line Class Code value used for the hypothetical subscriber. Specify an integer value in the range 0 - 2147483646. The default is 0.</p> <p>Alternatively, for a validated Line Class Code, you can select a specific value from the list of valid values by clicking on the ellipsis symbol at the end of the field. Either scroll down the alphabetic list of code value descriptions to select the value you want, or type the first few letters of the code's description so that the alphabetic list scrolls to select the entry you want.</p>
Controlling ESA Protection Domain	Change	<p>Specifies whether this test is to simulate operation in Emergency Standalone (ESA) mode, and if so the ESA Protection Domain from which the test is to simulate running. Select from the drop-down list of ESA Protection Domains, or select None: Main Call Agent in control to run the test normally (not in ESA mode).</p>
Authorization Code - Code and PIN	Change	<p>Indicates the authorization code and PIN, if any, associated with the Routing request. Specify the authorization code as a string of numeric digits, as it would be provided by the subscriber. If a PIN is required, append the 4 digits of the PIN to the end of the authorization code (without any spaces or other characters in between the code and PIN).</p>
Authorization Code - Final Destination Number	Change	<p>If the Routing request requires an authorization code followed by the final destination number, specify the final destination number (as a full directory number) in this field.</p>

Parameter	Access	Description
Included media channels - media channels included	Change	<p>Specifies whether to run the test as though not all of the configured media channels are available. For example, you can use this field to simulate running the test in Emergency Standalone mode, in which only MF and SIP trunks connected to the Media Gateway in the specified ESA Protection Domain are available.</p> <p>Values:</p> <ul style="list-style-type: none"> • All (default) Any configured media channel can be used in the test. • Specified Only the media channels specified in the following Included media channels - media channel fields can be used in the test. • All except specified Any media channel can be used in the test except for those specified in the following Included media channels - media channel fields. • None No media channel can be used in the test. It will complete successfully only if it is to a number on this switch and does not require trunk routing. <p>If this field is set to Specified or All except specified, you must set at least one of the following Included media channels - media channel fields to indicate one or more channels to be included or excluded.</p> <p>If you run this test and routing cannot be completed using the media channels that are permitted by the setting of these fields, the test will be marked as failed.</p>

Parameter	Access	Description
Included media channels - media channel 1	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. To remove the selected channel or trunk so that it is no longer included or excluded, select None .
Included media channels - media channel 2	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 3	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 4	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .

Parameter	Access	Description
Included media channels - media channel 5	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 6	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 7	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 8	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .

Parameter	Access	Description
Included media channels - media channel 9	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - media channel 10	Change	This field appears only if Included media channels - media channels included is set to Specified or All except specified . A media channel to be included or excluded when running this test. If you need to select additional media channels to include or exclude, set this field as for Included media channels - media channel 1 .
Included media channels - simulated incoming release cause	Change	<p>Specifies whether to run the test as though it is a re-routing attempt because an earlier attempt to route the call over an ISUP or ISDN trunk failed. In general you should use this field in conjunction with the earlier Included media channels fields to exclude the trunk on which the earlier routing attempt would have failed.</p> <p>The valid values for this field, except for None and Use values on Test Group, are a subset of those defined in Q.850; the other values defined in Q.850 identify release causes for which re-routing is not appropriate, or are not appropriate to ISUP or ISDN trunks. Values:</p> <ul style="list-style-type: none">• None Run the test as though there is no release cause specified (for example on the first pass through routing).• 2 No route to specified transit network (national use)• 3 No route to destination• 34 No circuit / channel available• 41 Temporary failure• 42 Switching equipment congestion

Parameter	Access	Description
		<ul style="list-style-type: none"> • 43 Access information discarded • 44 Requested circuit / channel not available • 46 Precedence call blocked • 47 Resource unavailable, unspecified • 58 Bearer capacity not presently available • 62 Inconsistency in outgoing information element • 63 Service or option not available, unspecified • 65 Bearer capability not implemented • 69 Requested facility not implemented • 70 Only restricted digital info bearer capability available • 79 Service option not implemented, unspecified • 88 Incompatible destination • 95 Invalid message, unspecified • 97 Message type non-existent or not implemented • 99 Info element / parameter non-existent or not implemented • 102 Recovery on timer expiry • 103 Parameter non-existent or not implemented - passed on • 111 Protocol error, unspecified • 127 Interworking, unspecified • Use values on Test Group Use the simulated incoming release cause, if any, specified on the parent Route Verification Test Group.

Parameter	Access	Description
Included media channels - simulate media channels online	Change	<p>Specifies whether the status of each Media Channel is checked when the test is run. Choose Use default or specify a value:</p> <ul style="list-style-type: none"> • True The status of each Media Channel is not checked - all channels are assumed to be online. • False A Media Channel can be used for the test only if it is online. <p>Regardless of the setting of this field, the test still includes other admission control checks: for example, the Media Channel must exist, have suitable bearer capabilities, be uncongested, and support outgoing calls.</p>
Test result	Read only	<p>This field is valid only after the test has been run. To run the test, click on the 'Run test' pushbutton. This field indicates the status of the last test run. Note that if any of the previous fields have been modified since the last test was run, this field will be set to Not yet run. Values:</p> <ul style="list-style-type: none"> • Not yet run The test has not been run yet, or one of more of the previous fields has changed since the test was last run. • Result pending The test is in progress. • Succeeded The test has run and both the number validation and the routing succeeded. • Identified Call Service access code The test has run, and the routing component has identified the number dialed as a call service access code. • Not able to run The test was not able to run because the routing component is not in a suitable state to route requests. • Failed – number validation The test was run and number validation failed.

Parameter	Access	Description
		<ul style="list-style-type: none">• Failed – routing The test was run and routing failed.• Calling number not found The subscriber whom the test is simulating dialing does not exist.• Called number not found The routing component has determined that the call should be routed to a subscriber on this switch but the subscriber does not exist.• System not fully active The test cannot be run because the system is not fully set up.• Canceling The test is in the process of being canceled, either because an administrator used the "Cancel all tests" action in the parent Route Verification Test Group object or because one or more test values were changed.• Canceled The test was canceled.

Parameter	Access	Description
Cause of failure	Read only	<p>This field is valid only if Test result is set to Failed – number validation or Failed – routing. This field specifies the cause for either the number validation or routing failure. Values:</p> <ul style="list-style-type: none">• None• Incomplete digits• Address incomplete• Configuration inconsistent• Incomplete digit map• Number validation failed• Routing failed• Address not valid• Transit not valid• No route to address• No route to transit• Maximum number of routes tried• No route to address (congestion)• No route to transit (congestion)• LNP call misrouted• Unallocated number• Internal routing error• Temporary failure• Resource shortage• Call rejected
Expected result - expected result	Change	<p>Specifies whether you expect this test to succeed or fail, and the failure mode if appropriate. Values:</p> <ul style="list-style-type: none">• Use values on Test Group (default) Use the default Expected results values specified on the parent Route Verification Test Group.• None• Succeeded• Identified Call Service access code• Failed - number validation• Failed - routing• Called number not found• Query failed

Parameter	Access	Description
Expected result - expected destination	Change	<p>This field appears only if Expected result - expected result is Succeeded. Specifies the destination or range of destinations to which you expect this test to route. Values:</p> <ul style="list-style-type: none">• Any media channel or on-switch subscriber (default) The test should be regarded as passed regardless of the chosen destination.• One of specified media channels The test should be regarded as passed only if it routes to a media channel specified in the following Expected results - media channel fields.• Any media channel except specified The test should be regarded as passed if it does not to a media channel specified in the following Expected results - media channel fields.• On-switch subscriber The test should be regarded as passed only if it routes to a subscriber on this switch.
Expected result - media channel 1	Change	<p>This field appears only if Expected results - expected destination is One of specified media channels or Any media channel except specified. A media channel considered to be valid or not valid for this test. Click on the ellipsis symbol to the right of this field to choose whether to select from a list of MF Media Channels, ISDN trunk PRIs, ISUP Media Channels or SIP Trunks, then select the appropriate channel or trunk from the list. To remove the selected channel or trunk so that it is no longer considered to be valid or not valid, select None.</p>

Parameter	Access	Description
Expected result - media channel 2	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for tests in this group, set this field as for Expected result - media channel 1 .
Expected result - media channel 3	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 4	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 5	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .

Parameter	Access	Description
Expected result - media channel 6	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 7	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 8	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - media channel 9	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .

Parameter	Access	Description
Expected result - media channel 10	Change	This field appears only if Expected result - expected destination is One of specified media channels or Any media channel except specified . A media channel considered to be valid or not valid for this test. If you need to select additional media channels considered to be valid or not valid for this test, set this field as for Expected result - media channel 1 .
Expected result - cause of failure	Change	This field appears only if Expected result - expected result is Failed - number validation or Failed - routing . The expected cause for either the number validation or routing failure. Values: <ul style="list-style-type: none">• None• Incomplete digits• Address incomplete• Configuration inconsistent• Incomplete digit map• Number validation failed• Routing failed• Address not valid• Transit not valid• No route to address• No route to transit• Maximum number of routes tried• No route to address (congestion)• No route to transit (congestion)• LNP call misrouted• Unallocated number• Internal routing error• Temporary failure• Resource shortage• Call rejected

Parameter	Access	Description
Expected result - result as expected	Read only	This field does not appear if Expected result - expected result is None , or if it is Use values on Test Group and the parent Test Group's value is None . Indicates whether the result of the last run of this test matched the expected result. Values: <ul style="list-style-type: none">• Yes• No• Not yet run to completion The test has not been run to completion since its configuration parameters were last changed.
Number validation – carrier type	Read only	The carrier type for the call specified on the output from number validation. Values: <ul style="list-style-type: none">• Unknown• LEC• InterLATA• International• InterLATA and international
Number validation – ANI II digits	Read only	The ANI II digit specified on the output from number validation. A value of zero indicates that the ANI digits have not been set.
Number validation – area code dialed	Read only	Specifies whether the output from number validation included the dialed area code. Values: <ul style="list-style-type: none">• Not applicable• Not dialed• Dialed
Number validation – modified called number	Read only	The modified called number specified on the output from number validation.
Number validation – modified calling party number	Read only	The modified calling party number specified on the output from number validation.

Parameter	Access	Description
Number validation – modified charge number	Read only	The modified charge number specified on the output from number validation.
Number validation – carrier selection method	Read only	The carrier selection method specified on the output from number validation. Values: <ul style="list-style-type: none">• Unspecified• Presubscribed• Presubscribed and input• Presubscribed, may have been input• Input
Number validation – FGD carrier ID	Read only	The Feature Group D carrier ID specified on the output from number validation.
Number validation – call hold allowed	Read only	Whether the output from number validation specifies that holding the call is allowed. Values: <ul style="list-style-type: none">• True• False
Number validation – operator call	Read only	Whether the output from number validation specifies that the call is an operator call. Values: <ul style="list-style-type: none">• True• False
Number validation – restricted line 950 call	Read only	Whether the output from number validation specifies that the call is to a 950-XXXX number from a restricted line. Values: <ul style="list-style-type: none">• True• False
Number validation – signaling access signaling type	Read only	Whether the output from number validation specifies that the access signaling type should be signaled by ISUP for operator calls when using the “modified nature of address” encoding as specified in GR-1277. Values: <ul style="list-style-type: none">• True• False

Parameter	Access	Description
Number validation – signal FGD carrier ID indicator	Read only	Whether the output from number validation specifies that the FGD carrier ID should be signaled by ISUP. Values: <ul style="list-style-type: none">• True• False
Number validation – test call	Read only	Whether the output from number validation specifies that the call is a test call. Values: <ul style="list-style-type: none">• True• False
Number validation – tone or announcement ID	Read only	The tone or announcement ID specified on the output from number validation.
Number validation – tone or announcement parameter 1	Read only	The tone or announcement parameter 1 specified on the output from number validation.
Number validation – tone or announcement parameter 2	Read only	The tone or announcement parameter 1 specified on the output from number validation.
Number validation – Transit Network ID	Read only	The Transit Network ID specified on the output from number validation.

Parameter	Access	Description
Number validation – call type	Read only	The call type specified on the output from number validation. Values: Values: <ul style="list-style-type: none">• Unknown• Operator• Emergency• Local• IntraLATA• InterLATA national• InterLATA international• Toll free• Premium• Other non-geographic• Operator Service• Directory Assist• FGD cut through• FGB• International• International toll free• Other N11• Other
Number validation – dialed prefix	Read only	The dialed prefix specified on the output from number validation. Values: <ul style="list-style-type: none">• Unknown• 1+• 0+• 0-• None
Number validation – use modified operator NOA encoding	Read only	Whether the output from number validation specifies that ISUP should encode the IAM for an operator call according to the “basic” NOA or “modified” NOA rules as described in GR-1277. Values: <ul style="list-style-type: none">• True• False

Parameter	Access	Description
Number validation – use operator requested NOA encoding	Read only	Whether the output from number validation specifies that ISUP should use the “operator requested” called address NOA variant when signaling an operator call. Values: <ul style="list-style-type: none">• True• False
Number validation - echo cancellation	Read only	Whether the output from number validation specifies that echo cancellation is required for the call. Values: <ul style="list-style-type: none">• None• Preferred• Required
Number validation – user defined attribute 1 - 20	Read only	This field appears once for each Line Class Code that you have configured below the Trunk Routing and Policy Services object. The user defined attributes specified on the output from number validation.
Number validation - user defined MF call type	Read only	The User defined MF call type specified on the output from number validation.
Number validation – message billing index	Read only	The message billing index specified on the output from number validation.
Number validation – use Pseudo ANI (pANI)	Read only	Whether the output from number validation specifies that the calling party fields in outgoing messages contain the Charge Number from the original call (instead of the Calling Party Number). Values: <ul style="list-style-type: none">• Never• Only when no calling number• Always

Parameter	Access	Description
Number validation – pseudo ANI egress signaling types	Read only	This field does not appear if Number validation - use Pseudo ANI (pANI) is Never . The types of outgoing signaling stack for which Pseudo ANI is to be used, as specified on the output from number validation. Values: <ul style="list-style-type: none">• ISUP• ISDN access• ISDN trunk• SIP access• SIP trunk• Analog
Number validation – pseudo ANI presentation indicator	Read only	This field does not appear if Number validation - use Pseudo ANI (pANI) is Never . The presentation indicator to be used with Pseudo ANI, as specified on the output from number validation. Values: <ul style="list-style-type: none">• Restricted• Available
Number validation – billing call type	Read only	The billing call type attribute, if any, specified on the output from number validation. Values: <ul style="list-style-type: none">• 1• 5• 6• 9• 33• 47• 88• 110• 119• 131• 132• 134• 141• 142• 710• 711• 720• 721• 800 - 999

Parameter	Access	Description
Number validation – billing structure code	Read only	The billing structure code attribute, if any, specified on the output from number validation. Values: <ul style="list-style-type: none"> • 1 • 20 • 28 • 79 • 220 • 360 • 364 • 500 • 625 • 653
Number validation – override AIN billing	Read only	Whether the output from number validation specifies that the structure code and call type in AIN billing records for this call should be overridden with the configured values. Values: <ul style="list-style-type: none"> • Yes • No
Number validation - ISUP called address prefix	Read only	This field is used only for long-distance calls in Canada that are routed over ISUP trunks, and is not required for deployments elsewhere. Specifies the prefix, if any, added to the called number in the ISUP IAM message.

Parameter	Access	Description
Number validation – ANI Screening lookup type	Read only	<p>The type of ANI Screening lookup, if any, specified on the output from number validation. Values:</p> <ul style="list-style-type: none">• None No ANI Screening lookup.• Lookup on carrier code (North America only) Check that the Transit Network ID associated with the call matches the on-switch carrier configured for the active Config Set, and if so perform an ANI Screening lookup using the configured ANI Screening Table.• Lookup in specific table Use the ANI Screening Table specified in Number validation - ANI Screening lookup table to perform the lookup (without checking the Transit Network ID).
Number validation - ANI Screening lookup table	Read only	<p>This field applies only if Number validation - ANI Screening lookup type is set to Lookup in specific table. Specifies the ANI Screening Table to be used for the ANI Screening lookup.</p>

Parameter	Access	Description
Number validation – Number type for ANI lookup	Read only	<p>The ANI lookup number type, if any, specified on the output from number validation. This identifies the type of number associated with the call that should be looked up in an ANI Screening lookup. If this number is not available, the call is processed as if no match could be found. Values:</p> <ul style="list-style-type: none">• Charge number Use the Charge Number for lookup.• Charge number preferred Use the Charge Number for lookup if it is available; use the Calling Party Number if this is the only number available.• Calling party number Use the Calling Party Number for lookup.• Calling party number preferred Use the Calling Party Number for lookup if it is available; use the Charge Number if this is the only number available.
Number validation – Number used for ANI lookup	Read only	<p>The number that was used for ANI lookup, if any, specified on the output from number validation.</p>
Number validation – Matched ANI Screening Entry type	Read only	<p>The type of ANI Screening match, if any, specified on the output from number validation. Values:</p> <ul style="list-style-type: none">• Not matched No ANI Screening Entry was matched.• Allowed The call matched an Allowed ANI Screening Entry.• Denied The call matched a Denied ANI Screening Entry.
Number validation – Matched ANI Screening Entry	Read only	<p>This field does not appear if Number validation - Matched ANI Screening Entry type is set to Not matched. The name of the ANI Screening Entry that was matched in number validation.</p>

Parameter	Access	Description
Number validation - Authorization Code Operation	Read only	<p>The authorization code operation required for this call, if any, determined in number validation. Values:</p> <ul style="list-style-type: none">• None No authorization code is required.• No Validation The authorization code specified in Number Validation - Authorization Code Prefix is used in billing records for the call. The subscriber is not required to dial an authorization code to make the call.• On-Switch Calling Card / Hotline The subscriber must dial an authorization code to make the call, and the following fields define how this code is validated.
Number validation - Authorization Code Table	Read only	<p>This field appears only if Number validation - Authorization Code Operation is visible and set to On-Switch Calling Card / Hotline. The authorization code table used for this call, if any, determined in number validation.</p>
Number validation - Valid Authorization Codes	Read only	<p>This field appears only if Number validation - Authorization Code Operation is visible and set to On-Switch Calling Card / Hotline. The authorization code matching required for this call, if any, determined in number validation. Values:</p> <ul style="list-style-type: none">• Any code in table The subscriber can use any authorization code in the table specified by Number Validation - Authorization Code Table.• Specific code The subscriber must use a specific authorization code.

Parameter	Access	Description
Number validation - Authorization Code Prefix	Read only	<p>The authorization code prefix required for this call, if any, determined in number validation. The use of this field depends on the setting of Number validation - Authorization Code Operation, as follows.</p> <ul style="list-style-type: none"> • If Authorization Code Operation is None, this field does not appear. • If Authorization Code Operation is No Validation, this field contains the complete authorization code that is added to billing records for the call. • If Authorization Code Operation is On-Switch Calling Card / Hotline, this field defines an optional prefix for the authorization code. The complete code that is checked against authorization code tables consists of this prefix followed by the code dialed by the subscriber. For example, if the authorization code is the subscriber's home directory number (validated by a PIN), this field could contain the NPA code so that the subscriber need only enter the 7D number.
Number validation – maximum call duration	Read only	The maximum call duration, if any, specified on the output from number validation.
Routing – test call	Read only	<p>Whether the output from the routing step specifies that the call is a test call.</p> <p>Values:</p> <ul style="list-style-type: none"> • True • False
Routing – modified called number	Read only	The modified called number specified on the output from the routing step.
Routing – modified calling party number	Read only	The modified calling party number specified on the output from the routing step.
Routing – modified charge number	Read only	The modified charge number specified on the output from the routing step.

Parameter	Access	Description
Routing – operator call	Read only	Whether the output from the routing step specifies that the call is an operator call. Values: <ul style="list-style-type: none">• True• False
Routing – tone or announcement ID	Read only	The tone or announcement ID specified on the output from the routing step.
Routing – tone or announcement parameter 1	Read only	The tone or announcement parameter 1 specified on the output from the routing step.
Routing – tone or announcement parameter 2	Read only	The tone or announcement parameter 1 specified on the output from the routing step.
Routing – Transit Network ID	Read only	The Transit Network ID specified on the output from the routing step.
Routing – tandem routing code	Read only	This field is valid only if the routing step was successful. The tandem routing code specified on the output from the routing step.
Routing – non op assisted international routing code	Read only	This field is valid only if the routing step was successful. The international routing code (non-operator assisted) specified on the output from the routing step.
Routing – op assisted international routing code	Read only	This field is valid only if the routing step was successful. The international routing code (operator assisted) specified on the output from the routing step.
Routing – media channel	Read only	This field appears only if the routing step was successful and the call is not routed to a subscriber on this switch. Specifies the media channel over which the call is to be routed (MF Trunk, ISUP trunk, ISDN PRI, or SIP trunk), or specifies Announcement service if the call is routed to an announcement.

Parameter	Access	Description
Routing - on-switch subscriber type	Read only	<p>This field appears only if the routing step was successful and the call is routed to another subscriber on this switch. Specifies the type of subscriber to which the call is to be routed. Values:</p> <ul style="list-style-type: none"> • Individual Line • Business Group • Voicemail SMDI voicemail system • PBX • SIP Application Server or SIP voicemail system
Routing - on-switch subscriber number	Read only	<p>This field appears only if the routing step was successful and the call is routed to another subscriber on this switch. Specifies the directory number to which the call is to be routed.</p>
Routing - echo cancellation	Read only	<p>Whether the output from the routing step specifies that echo cancellation is required for the call. Values:</p> <ul style="list-style-type: none"> • None • Preferred • Required
Routing - maximum call duration	Read only	<p>The maximum call duration, if any, specified on the output from the routing step.</p>

Parameter	Access	Description
TCAP queries – Local Number Portability	Read only	The result of any TCAP queries for local number portability. Values: <ul style="list-style-type: none">• Failed – resource allocation failure• Failed - parameter information unavailable• Failed – TCAP failure• Not required• Successful (no Automatic Code Gapping)• Successful (encountered Automatic Code Gapping)• Not attempted – restriction on current call• Not attempted – Automatic Code Gapping controls in place• Failed – bad response• Failed – timeout
TCAP queries – Toll Free Lookup	Read only	The result of any TCAP queries for toll free lookup. Values: <ul style="list-style-type: none">• Failed – resource allocation failure• Failed - parameter information unavailable• Failed – TCAP failure• Not required• Successful (no Automatic Code Gapping)• Successful (encountered Automatic Code Gapping)• Not attempted – restriction on current call• Not attempted – Automatic Code Gapping controls in place• Failed – bad response• Failed – timeout

Parameter	Access	Description
Diagnostics - logging - log level	Change	<p>Specifies the level of logs recorded for this object. Logs with a priority equal to or greater than the priority specified are recorded. Set to Default level to use the system-wide default level. Values:</p> <ul style="list-style-type: none">• Level 10 (diagnostics)• Level 20 (verbose statistics)• Level 30 (verbose operational)• Level 40 (statistics)• Level 50 (audit)• Level 60 (operational)• Level 70 (unexpected)• Level 80 (error)• Level 90 (fatal)• Default level (default)
Diagnostics - API trace - trace tag	Change	<p>An optional text string inserted into API tracing and PD logging for this object. (This string can include accented / international characters as defined in ISO 8859-1.)</p> <p>If you want to filter on this tag in the craft interface, do not include spaces or any of the characters ^ \ \$ * + ? () , . ~ ` " [] { }.</p>
Requested status	Read only	<p>Specifies whether an administrator has attempted to enable the Subscriber Route Verification Test. Values:</p> <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	<p>Specifies the current status of the Subscriber Route Verification Test object. Values:</p> <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

4.2.6 Test Calls

The Test Calls object is a child of the Test Function object. It contains information about how the MetaSwitch NE handles the different Test Line services and ANI Test Service.

This object is pre-configured (configuration information is delivered with the MetaSwitch NE), and you cannot create or delete it.

Parameters relating to each type of Test Call are visible in the EMS System Explorer only when that type of Test Call is set to Configured or Disabled.

Actions

<input checked="" type="checkbox"/> Create	<input checked="" type="checkbox"/> Enable	<input checked="" type="checkbox"/> Activate
<input checked="" type="checkbox"/> Delete	<input checked="" type="checkbox"/> Disable	<input checked="" type="checkbox"/> Deactivate
<input checked="" type="checkbox"/> Apply	<input checked="" type="checkbox"/> Reset Statistics	<input checked="" type="checkbox"/> Refresh
<input checked="" type="checkbox"/> Import	<input checked="" type="checkbox"/> Export	<input checked="" type="checkbox"/> Output

Parameter	Access	Description
Test Line 100 support	Change Inactive	Specifies whether the switch is currently configured to support Test Line 100 (which plays a 1004Hz tone back to the caller for a fixed period of time, followed by silence). Values: <ul style="list-style-type: none"> • Configured • Not configured (default) • Disabled
Test Line 100 - access number	Change Inactive	A directory number that a tester can use as an alternative number to access Test Line 100. This field is visible if Test Line 100 support is set to Configured or Disabled . Select from the displayed list of Reserved Numbers on this switch that are not already in use.
Test Line 100 - number of available lines	Change Inactive	The number of lines available for Test Line 100. This controls the number of test calls that can be active at any one time to this switch. This field is visible if Test Line 100 support is set to Configured or Disabled . Range: 1 - 20. The default is 5.

Parameter	Access	Description
Test Line 100 - length of tone interruptions	Change Inactive	The length, in seconds, of interruptions in the disconnect tone played on Test Line 100. This field is visible if Test Line 100 support is set to Configured or Disabled . Range: 0 - 3. The default is 2. A value of 0 (zero) indicates that the tone is played continuously with no interruptions.
Test Line 100 - interval between tone interruptions	Change Inactive	The interval, in seconds, between interruptions in the disconnect tone played on Test Line 100; note that this interval includes the length of both the tone and the interruption. This field appears only if Test Line 100 support is set to Configured or Disabled and Test Line 100 - length of tone interruptions is non-zero. Range: 9 - 12. The default is 9.
Test Line 100 - return disconnect (on hook) during tone interruptions	Change Inactive	Specifies whether a disconnect (on-hook) signal should be played during tone interruptions on Test Line 100. This field appears only if Test Line 100 support is set to Configured or Disabled and Test Line 100 - length of tone interruptions is non-zero. Values: <ul style="list-style-type: none"> • True (default) • False
Test Line 100 - disconnect holding time	Change Inactive	The interval, in minutes, after which the switch should disconnect a call on Test Line 100 if the remote caller has not already disconnected it. A value of 0 (zero) indicates that the call will be maintained indefinitely until the remote caller disconnects it. The default is zero.

Parameter	Access	Description
Test Line 101 support	Change Inactive	Specifies whether the switch is currently configured to support Test Line 101 (which routes the caller to a particular subscriber, typically someone in your central office). Values: <ul style="list-style-type: none">• Configured• Not configured (default)• Disabled
Test Line 101 - Subscriber number	Change Inactive	The directory number that a tester calling Test Line 101 is connected to. This field is visible if Test Line 101 support is set to Configured or Disabled . Either type in the number of the Individual Line configured for use by Test Line 101, or click on the ellipsis symbol to the right of this field to select from a list of configured Individual Line directory numbers.
Test Line 102 support	Change Inactive	Specifies whether the switch is currently configured to support Test Line 102 (which plays a 1004Hz tone back to the caller). Values: <ul style="list-style-type: none">• Configured• Not configured (default)• Disabled
Test Line 102 - access number	Change Inactive	A directory number that a tester can use as an alternative number to access Test Line 102. Select from the displayed list of Reserved Numbers on this switch that are not already in use.
Test Line 102 - number of available lines	Change Inactive	The number of lines available for Test Line 102. This controls the number of test calls that can be active at any one time to this switch. Range: 1 - 20. The default is 5.
Test Line 102 - length of tone interruptions	Change Inactive	The length, in seconds, of interruptions in the test tone played on Test Line 102. Range: 0 - 3. The default is 2. A value of 0 (zero) indicates that the tone is played continuously with no interruptions.

Parameter	Access	Description
Test Line 102 - interval between tone interruptions	Change Inactive	The interval, in seconds, between interruptions in the test tone played on Test Line 102; note that this interval includes the length of both the tone and the interruption. This field appears only if Test Line 102 - length of tone interruptions is non-zero. Range: 9 - 12. The default is 9.
Test Line 102 - return disconnect (on hook) during tone interruptions	Change Inactive	Specifies whether a disconnect (on-hook) signal should be played during tone interruptions on Test Line 102. This field appears only if Test Line 102 - length of tone interruptions is non-zero. Values: <ul style="list-style-type: none"> • True (default) • False
Test Line 102 - disconnect holding time	Change Inactive	The interval, in minutes, after which the switch should disconnect a call on Test Line 102 if the remote caller has not already disconnected it. A value of 0 (zero) indicates that the call will be maintained indefinitely until the remote caller disconnects it. The default is zero.
Test Line 105 support	Change Inactive	Specifies whether the switch is currently configured to support Test Line 105 (which routes the caller to a responder, a piece of hardware which provides noise and loss measurement). Values: <ul style="list-style-type: none"> • Configured • Not configured (default) • Disabled

Parameter	Access	Description
Test Line 105 - Subscriber number	Change Inactive	<p>The directory number to which the responder for Test Line 105 is connected. This field is visible if Test Line 105 support is set to Configured or Disabled.</p> <p>Either type in the number of the Individual Line used by the Test Line 105 responder, or click on the ellipsis symbol to the right of this field to select from a list of configured Individual Line directory numbers. You should not configure any Call Services on the subscriber line which Test Line 105 uses, with the exception of Busy Call Forwarding which allows multiple responders to be used.</p>
Test Line 108 support	Change Inactive	<p>Specifies whether the switch is currently configured to support Test Line 108 (which connects the caller in loopback mode). Values:</p> <ul style="list-style-type: none">• Configured• Not configured (default)• Disabled
Test Line 108 - access number	Change Inactive	<p>A directory number that a tester can use as an alternative number to access Test Line 108. Select from the displayed list of Reserved Numbers on this switch that are not already in use.</p>
Test Line 108 - number of available lines	Change Inactive	<p>The number of lines available for Test Line 108. This controls the number of test calls that can be active at any one time to this switch. Range: 1 - 20. The default is 5.</p>
Test Line 108 - disconnect holding time	Change Inactive	<p>The interval, in minutes, after which the switch should disconnect a call on Test Line 108 if the remote caller has not already disconnected it. Range: 1 - 20. The default is 20.</p>

Parameter	Access	Description
ANI Test Service support	Change Inactive	Specifies whether the switch is currently configured to support ANI Test Service (which reads back the calling directory number). Values: <ul style="list-style-type: none">• Configured• Not configured (default)• Disabled
ANI Test Service - access code	Change Inactive	The access code that a tester dials to access ANI Test Service. This field appears only if ANI Test Service support is Configured or Disabled . Specify a number of maximum 32 digits. (In North America, access codes are typically * followed by two digits.) If preferred, you can specify a telephone number (10 digits) instead of an access code. In this case, you should configure this number as a Reserved Number to ensure that it cannot be assigned as a subscriber's directory number. You should also take care not to use this number for another service that uses a Reserved Number (such as Remote Access to Call Forwarding or Test Line 102).
Requested status	Read only	Specifies whether an administrator has attempted to enable the Test Calls object. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.
Actual status	Read only	Specifies the current status of the Test Calls object. Values: <ul style="list-style-type: none">• Enabled The object has been enabled.• Disabled The object has not been enabled or has been disabled.

Parameter	Access	Description
Alarm state	Read only	Specifies whether any alarms are currently raised for this object. Values: <ul style="list-style-type: none"> • Clear No alarms are currently raised. • Attention Required Attention Required - the object is not operating normally, and needs operator intervention. • Attend To Dependent Attention Required elsewhere - another object on which this object depends is not operating normally.
Alarm state changed timestamp	Read only	The time at which the Alarm state last changed.
Alarm log correlator - Attention Required	Read only	Identifier of the log message for the event that caused the last Attention Required alarm state for this object. This field is reset when the Attention Required alarm events field is reset to zero.
Attention Required alarm events	Read only / Reset	Number of times (since the alarm count was reset) that this object's alarm state has gone to Attention Required .
Alarm events reset timestamp	Read only	The time at which the Attention Required alarm events was last reset to zero.
Alarm log correlator - Attend To Dependent	Read only	Identifier of the log message for the event that caused the last Attend To Dependent alarm state for this object. This field is reset when the Attend To Dependent alarm events field is reset to zero.
Attend To Dependent alarm events	Read only / Reset	Number of times (since the alarm count was reset) that this object's alarm state has gone to Attend To Dependent .

Parameter	Access	Description
Attend To Dependent alarm events reset timestamp	Read only	The time at which the Attend To Dependent alarm events field was last reset to zero.

4.3 Statistics Objects

This section provides information about the statistics objects that are associated with the Call Verification objects.

4.3.1 Test Calls Service Statistics

The Test Calls Service Statistics object is a child of the Test Calls object. There is a single instance of the Test Calls Service Statistics object. The Test Calls Service Statistics object does not have any fields or pushbuttons, and you cannot configure or manage it. It exists simply as a way of grouping its 'Summary Period' child objects.

Counter type statistics record the total count of events (or time) during the particular time interval. High and Low type statistics record the highest or lowest value of the field reached during the particular time interval. Gauge type statistics show the average value of the field during the particular time interval, with a sampling rate of once every 5 minutes. Gauge statistics for the current and previous 5 minute time intervals are therefore a single snapshot value.

There are eight 'Summary Period' Test Calls Service Statistics objects, which each display statistics collected over a different time interval. Note that the summary periods are preconfigured; you cannot change the summary periods or create new 'Summary Period' Test Calls Service Statistics objects. All the 'Summary Period' Test Calls Service Statistics objects have the same fields. All the fields are read only and there are no management actions associated with these objects.

'Summary Period' Test Calls Service Statistics

The following statistics are collected for the Test Calls Service.

Parameter	Type of statistic	Description
Test Line 100 - total number of calls successfully connected	Counter	Total number of calls successfully connected to Test Line 100.
Test Line 100 - total number of calls rejected (all lines in use)	Counter	The total number of calls to Test Line 100 that were rejected because all available lines for this service were already in use.

Parameter	Type of statistic	Description
Test Line 100 - total number of calls rejected or cut short (no resource)	Counter	The total number of calls to Test Line 100 that were rejected or cut short because of a resource shortage.
Test Line 100 - total number of calls released by test line (holding timer expired)	Counter	The total number of calls to Test Line 100 that were released because the timer expired.
Test Line 100 - maximum simultaneous test lines in use	High	The highest number of lines that have been in simultaneous use for Test Line 100 calls during the summary period.
Test Line 100 - length of longest call (minutes)	High	The length in minutes of the longest Test Line 100 call during this summary period. The combination of this field and the following field gives the total length of the call; for example, a value of 2 in this field and 15 in the following field indicates that the longest call lasted for 2 minutes 15 seconds.
Test Line 100 - length of longest call (seconds)	(see previous field)	The seconds value of the length of the longest Test Line 100 call during this summary period. See the description of the previous field for details.
Test Line 102 - total number of calls successfully connected	Counter	Total number of calls successfully connected to Test Line 102.
Test Line 102 - total number of calls rejected (all lines in use)	Counter	The total number of calls to Test Line 102 that were rejected because all available lines for this service were already in use.
Test Line 102 - total number of calls rejected or cut short (no resource)	Counter	The total number of calls to Test Line 102 that were rejected or cut short because of a resource shortage.

Parameter	Type of statistic	Description
Test Line 102 - total number of calls released by test line (holding timer expired)	Counter	The total number of calls to Test Line 102 that were released because the timer expired.
Test Line 102 - maximum simultaneous test lines in use	High	The highest number of lines that have been in simultaneous use for Test Line 102 calls during the summary period.
Test Line 102 - length of longest call (minutes)	High	The length in minutes of the longest Test Line 102 call during this summary period. The combination of this field and the following field gives the total length of the call; for example, a value of 2 in this field and 15 in the following field indicates that the longest call lasted for 2 minutes 15 seconds.
Test Line 102 - length of longest call (seconds)	(see previous field)	The seconds value of the length of the longest Test Line 102 call during this summary period. See the description of the previous field for details.
Test Line 108 - total number of calls successfully connected	Counter	Total number of calls successfully connected to Test Line 108.
Test Line 108 - total number of calls rejected (all lines in use)	Counter	The total number of calls to Test Line 108 that were rejected because all available lines for this service were already in use.
Test Line 108 - total number of calls rejected or cut short (no resource)	Counter	The total number of calls to Test Line 108 that were rejected or cut short because of a resource shortage.
Test Line 108 - total number of calls released by test line (holding timer expired)	Counter	The total number of calls to Test Line 108 that were released because the timer expired.

Parameter	Type of statistic	Description
Test Line 108 - maximum simultaneous test lines in use	High	The highest number of lines that have been in simultaneous use for Test Line 108 calls during the summary period.
Test Line 108 - length of longest call (minutes)	High	The length in minutes of the longest Test Line 108 call during this summary period. The combination of this field and the following field gives the total length of the call; for example, a value of 2 in this field and 15 in the following field indicates that the longest call lasted for 2 minutes 15 seconds.
Test Line 108 - length of longest call (seconds)	(see previous field)	The seconds value of the length of the longest Test Line 108 call during this summary period. See the description of the previous field for details.
ANI Test Service - access count	Counter	The number of times the ANI Test Service access code was dialed.

Appendix A. Attribute Properties

This appendix supplements Chapter 2, **Introduction to Routing**. It provides additional information about specific attributes that can be set or modified during number validation and routing (in an Attribute Entry), as follows.

Table 1 summarizes where each attribute is relevant. This includes the stages of the routing request at which the attribute may be present, the components that add or update the attribute and the components that use the value of the attribute.

Table 2 details the constraints imposed on the value of each attribute on the Internal Routing Request that is forwarded from Number Validation to Call Routing. At the end of Number Validation, if any attributes are missing or have values that are not valid, a problem is logged and Number Validation fails (supplying an appropriate configuration error code). If any attributes are present that should not be present, they are discarded, a problem is logged, and call establishment continues.

Table 1. Components that add or use each attribute

In this table:

- **Input** indicates a parameter whose value is determined before the start of number validation (for example from configuration), and is used to control number validation and/or routing.
- **Output** indicates a parameter whose value is set during number validation and/or routing, and is used after routing has completed.
- **Internal** indicates a parameter that is used internally within number validation and/or routing, and has no significance outside this processing.

Attribute	Input, output or internal	Adder / Modifier	Users	Notes
Allowed carrier call type	Internal	Number validation	Number validation	
Allowed dialing pattern	Internal	Number validation	Number validation	
ANI II digits	Input, Output	Call Services, MF, ISUP, SIP	ISUP, MF, Billing	Set at originating exchange. No semantic interpretation of values.
ANI Screening lookup	Input, Output	Number validation	Number validation, Long distance service	
Announcement ID	Output	Any	Call Services Signaling	Output only if number validation or routing fails.
Announcement parameter 1	Output	Any	Call Services Signaling	Output only if number validation or routing fails.
Announcement parameter 2	Output	Any	Call Services Signaling	Output only if number validation or routing fails.

Attribute	Input, output or internal	Adder / Modifier	Users	Notes
Area code dialed	Output	Number validation	Billing, MF	Relevant only at call originating exchange.
Authorization Code Service	Input, Output	Number validation	Number validation, Long distance service, Billing	
Billing - call type	Output	Number validation	Billing	
Billing - override AIN billing	Output	Number validation	Billing	
Billing - structure code	Output	Number validation	Billing	
Call hold allowed	Input, Output	Signaling	Signaling	Normally changed only at originating exchange.
Call Type	Output	Number validation	Billing, routing, MF, Call Services	Output only at originating exchange.
Called address complete	Input, Output	Signaling, number validation	Number validation, routing, signaling	
Called address scope	Input, Output	Signaling (may be updated by number validation)	Signaling, billing, routing	

Attribute	Input, output or internal	Adder / Modifier	Users	Notes
Called address type	Input, Output	Signaling (may be updated by number validation)	Signaling, billing, routing, Call Services, Call Control	
Calling category	Input, Output	Call Services, MF, Number validation	ISUP	Maps directly to a field in the ISUP IAM.
Carrier call type	Internal	Number validation	Number validation	
Carrier type	Output	Number validation	MF	
Country code length	Output	Number validation	MF	Output only at North American originating exchange.
Customer announcement ID	Output	Number validation, Routing	Call Services Signaling	Output only if number validation or routing fails.
Dialed prefix	Output	Number validation	Billing, routing, ISUP, MF	Output only at originating exchange.
Dialing pattern	Internal	Number validation	Number validation	
Echo cancellation	Output	Number validation	ISUP, MF, Call Control	
FGD carrier dialing allowed	Internal	Number validation	Number validation	Originating exchange only.
FGD carrier ID	Output	Number validation	Signaling, billing, routing	Each digit has range 0x00 to 0x09 and length is always 4.

Attribute	Input, output or internal	Adder / Modifier	Users	Notes
FGD carrier requirement	Internal	Number validation	Number validation	Originating exchange only
Force LNP lookup	Output	Number validation	On-switch and LNP Lookups	
Force on-switch lookup	Output	Number validation	On-switch and LNP Lookups	
IN query ANI 1st - 3rd preference	Output	Number validation	Call Services, Billing, Signaling, Routing	
IN query ANI NPA	Output	Number validation	Call Services, Billing, Signaling, Routing	
IN query ANI NPA-NXX	Output	Number validation	Call Services, Billing, Signaling, Routing	
IN trigger index	Output	Number validation	Call Services	
IN trigger match type	Output	Number validation	Call Services	
ISUP called address prefix	Input, Output	Number validation	Routing	

Attribute	Input, output or internal	Adder / Modifier	Users	Notes
Maximum call duration	Output	Number validation, Routing	Call Control	If two or more non-zero values are specified at different stages of NV or Routing, the lowest non-zero value applies.
Message Billing Index	Output	Number validation	Billing	
Number type for ANI lookup	Input, Output	Number validation	Number validation, Long distance service	
Operator call	Input, Output	Number validation	Signaling, billing, routing	Set only at originating exchange.
Outgoing ISUP/ISDN Release Cause	Output	Number validation, Routing	ISUP, ISDN	
Permit when service suspended	Output	Number validation	Call Services	
Priority call	Input, Output	Number validation, signaling	Signaling, routing	
Pseudo ANI presentation indicator	Output	Number validation	Call Control, Call Services	If Use Pseudo ANI is set but this attribute is not set, defaults to restricted (number not presented to called user).

Attribute	Input, output or internal	Adder / Modifier	Users	Notes
Pseudo ANI egress signaling types	Output	Number validation	Call Control, If Use Pseudo ANI Call Services is set but this	attribute is not set, defaults to using Pseudo ANI on all signaling types.
Region code	Output	Number validation	MF	
Restricted line 950 calls	Output	Number validation	ISUP, MF	Set only at originating exchange. Currently set to fixed value.
Signal access signaling for operator call	Output	Number validation	ISUP	Originating exchange only.
Signal FGD carrier ID	Output	Number validation	ISUP	Originating exchange only.
Test call	Input, Output	Number validation, signaling	Routing, signaling	Set only at originating exchange.
Transit Network ID	Input, Output	Number validation	Routing, signaling	
US LATA	Output	Number validation	Call Services	
Use modified operator NOA encoding	Output	Number validation	ISUP	Originating exchange only.
Use operator requested NOA encoding	Output	Number validation	ISUP	Originating exchange only.
Use Pseudo ANI (pANI)	Output	Number validation	Call Control, Call Services	

Attribute	Input, output or internal	Adder / Modifier	Users	Notes
User Defined 1 - User Defined 20	Internal	Number validation	Number validation, Routing	Usage defined by Service Provider; no semantic interpretation of values.
User defined MF call type	Input, Output	Number validation, MF	MF	Present as input attribute only if the call is received over MF and the attribute is set up in MF Incoming Call Profile Data.

Table 2. Constraints on attributes output from Number Validation

Attribute	Constraint on number validation output
Allowed carrier call type	No constraints – internal only
Allowed dialing pattern	No constraints – internal only.
ANI II digits	Must be present in North America at call originating exchange. Constrained to have values from 00 to 99 (decimal).
ANI Screening lookup	If set to Lookup in specific table , the ANI Screening Lookup Table must also be specified.
Announcement ID	Can be set only when routing or number validation fails but is optional in these cases.
Announcement parameter 1	Can be set only in an Attribute Set where an Announcement ID is set.
Announcement parameter 2	Can be set only in an Attribute Set where an Announcement ID is set.
Area code dialed	Mandatory attribute at originating exchange. Must not be set to Unknown at originating exchange after completion of number validation.
Authorization Code Service	If set to On-Switch Calling Card / Hotline , the Authorization Code Table must also be specified.
Billing - call type	No constraints.
Billing - override AIN billing	No constraints.
Billing - structure code	No constraints.
Call hold allowed	No constraints.
Call Type	Must be set at originating exchange to value other than Unknown .

Attribute	Constraint on number validation output
Called address complete	Must be set unless overlap addressing is in use. In overlap addressing case, must be set if digit collection is being stopped.
Called address scope	Must not be Unknown .
Called address type	Must be E.164 (except for service access calls).
Calling category	No constraints.
Carrier call type	No constraints – internal only
Carrier type	Must not be Unknown .
Country code length	Must be 0 unless Called address scope is International . If Called address scope is International , must be 1 - 3.
Customer announcement ID	No constraints.
Dialed prefix	Must be set at originating exchange to value other than Unknown .
Dialing pattern	No constraints – internal only.
Echo cancellation	No constraints.
FGD carrier dialing allowed	No constraints – internal only
FGD carrier ID	Cannot be changed at non originating exchange.
FGD carrier requirement	No constraints – internal only
Force LNP lookup	No constraints.
Force on-switch lookup	No constraints.

Attribute	Constraint on number validation output
IN query ANI 1st - 3rd preference	If one of these attributes indicates that the MetaSwitch NE should use a configured ANI NPA or NPA-NXX value, the IN query ANI NPA or IN query ANI NPA-NXX attribute must also be set.
IN query ANI NPA	Must be set if one of the IN query ANI 1st - 3rd preference attributes indicates that the MetaSwitch NE should use a configured ANI NPA value.
IN query ANI NPA-NXX	Must be set if one of the IN query ANI 1st - 3rd preference attributes indicates that the MetaSwitch NE should use a configured ANI NPA-NXX value.
IN trigger index	No constraints.
IN trigger match type	Must be present if IN trigger index attribute is present.
ISUP called address prefix	No constraints.
Maximum call duration	No constraints.
Message Billing Index	Normally required for calls from a subscriber whose billing type is FX rate ; optional for other subscriber types.
Number type for ANI lookup	No constraints.
Operator call	Not set on input to number validation at originating exchange. Unchanged at non originating exchange.
Outgoing ISUP/ISDN Release Cause	No constraints.
Permit when service suspended	No constraints.
Priority call	Not set on input to number validation at originating exchange. Unchanged at non originating exchange.

Attribute	Constraint on number validation output
Pseudo ANI presentation indicator	No constraints.
Pseudo ANI egress signaling types	No constraints.
Region code	Set to 0 unless call is US world zone 1 international call. Set only at originating exchange. Valid range 0-9
Restricted line 950 calls	Not set.
Signal access signaling for operator call	Set only at originating exchange.
Signal FGD carrier ID	Set only at originating exchange.
Test call	No constraints.
Transit Network ID	Can be present only if FGD carrier ID is present.
US LATA	No constraints.
Use modified operator NOA encoding	Must be set at North American originating exchange.
Use operator requested NOA encoding	Must be set at North American originating exchange.
Use Pseudo ANI (pANI)	No constraints.
User Defined 1 - User Defined 20	No constraints.
User defined MF call type	No constraints. Present as input attribute only if the call is received over MF and the attribute is set up in MF Incoming Call Profile Data.

Appendix B. References

CNAC	Canadian Numbering Administration Consortium website, http://www.cnac.ca/
NANPA	North American Numbering Plan Administration (NANPA) website, http://www.nanpa.com/
Q.850	Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part, May 1998

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