



Semantix Roaming Studio

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2.0.0
User Manual

Semantix Roaming Studio

... the next generation TAP editor

Semantix Information Technologies

Semantix Roaming Studio

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Foreword

For the most part, you don't really need to read this document. Since the Semantix Roaming Studio application is intuitively easy to use we encourage you to simply fire up the application and start working with your TAP files. Online help for the rare cases you may need it is available through the application's graphical user interface. The online help in Semantix Roaming Studio version 2.0.0 and this document contain identical information and are synchronized.

Chapter



1

1 Introduction

Semantix Roaming Studio is a desktop application that enables you to view, edit, validate, import/export and perform miscellaneous other operations on TAP, RAP and NRTRDE files through a rich Graphical User Interface (GUI).

Semantix Roaming Studio version 2.0 works with all TAP3 releases (TAP3.1 up to TAP3.11 as of October, 2008), RAP1.4 (for all TAP releases) and NRTRDE 2.1.

This guide covers installation and user operations but doesn't deal with licensing and activation.

The guide and the screenshots also describe and apply to the activated version of the product. Note however that there are practically no differences in the working environment and supported features between the activated and the evaluation (not activated) versions. The only difference is that the "save" button is disabled in the evaluation version.

1.1 Acronyms and Abbreviations

ASCII **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange

ASN.1 **A**bstract **S**yntax **N**otation One (**1**)

DLL **D**ynamically **L**inked **L**ibrary

EULA **E**nd-**U**ser **L**icence **A**greement

GUI **G**raphical **U**ser **I**nterface

MDI **M**ultiple **D**ocument **I**nterface

TAP **T**ransferred **A**ccount **P**rocedure

RAP **R**eturned **A**ccount **P**rocedure

NRTRDE **N**ear **R**ea**T**-**T**ime **R**oaming **D**ata **E**xchange

Chapter



2

2 Installing Semantix Roaming Studio

This chapter provides information on installing Semantix Roaming Studio.

Please note that in all cases you need Administrator privileges on the machine on which you install Roaming Studio.

2.1 Installation Environments

Semantix Roaming Studio is a .NET-based application and can be installed on the following environments:

- Windows XP, Internet Explorer 6 with SP3 and .Net 3.5
- Windows Vista with SP1 and .Net 3.5
- Windows Server 2003 and .Net 3.5

A bare minimum hardware configuration required to run Roaming Studio is show on the table below:

- 256 MB of RAM
- 300 MB HD
- SVGA (1024x768 and upwards)

However, the following hardware configuration is recommended:

- 1GB of RAM
- 500 MB HD
- SVGA (1024x768 and upwards)

2.2 Installation Instructions

To Install Semantix Roaming Studio, you simply have to run "RoamingStudio.2.0.NNNN.exe" (where "NNNN" is the minor release number) and then follow the instructions of the Installation Wizard. If you don't have .NET 3.5 installed, the installation program will notify you and take you to the appropriate download page on Microsoft.com. The requirement to have .NET 3.5 installed is one of the reasons that Administrator privileges are required to perform the installation.

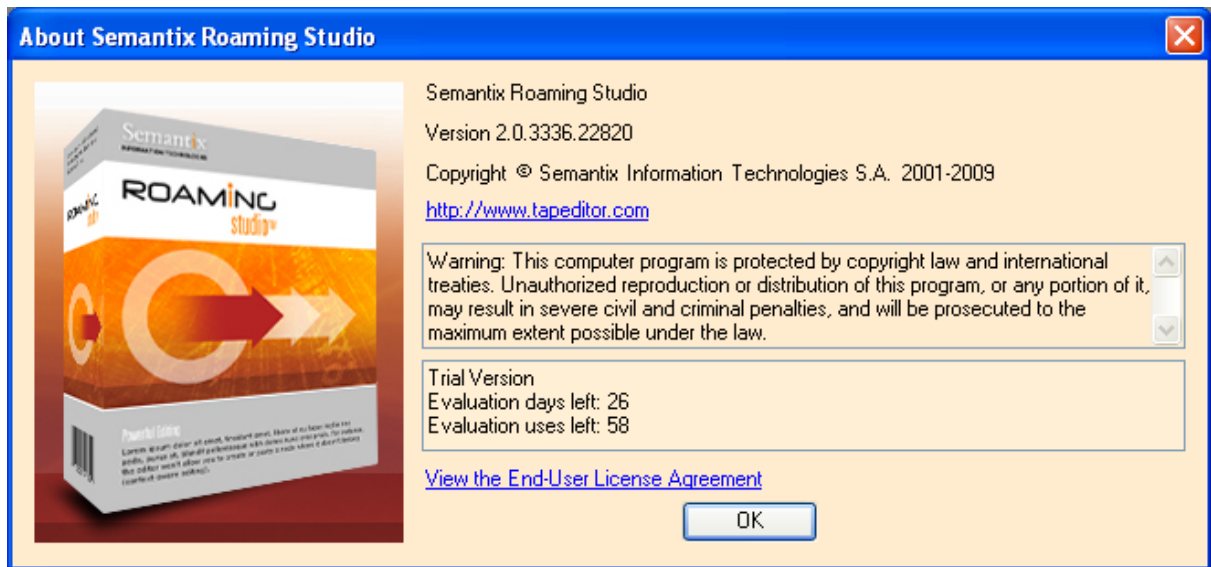
2.3 Testing the Installation

After the installation, select

Start → Programs → Semantix Roaming Studio 2.0 → Roaming Studio

The Roaming Studio splash screen will appear briefly, to be shortly followed by the main application window. Selecting **Help → About** will display the dialog depicted in the figure below, identifying the version of the application (at the time of writing this, at 2.0.3336.22820).

Note that the screenshot below is from an un-activated (evaluation) version.



“About” dialog for Semantix Roaming Studio, version 2.0.3336.22820.

Chapter



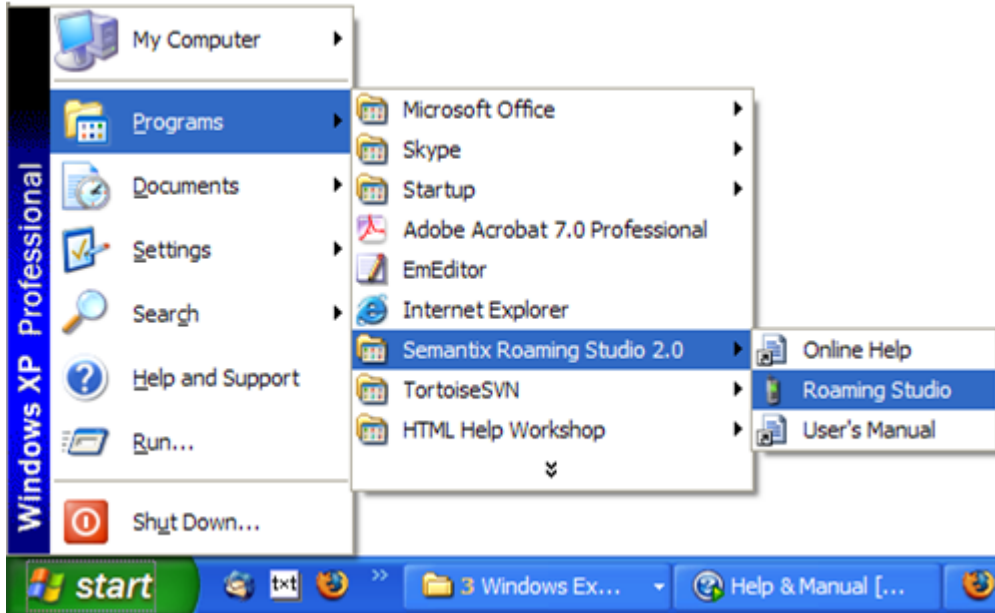
3

3 The Working Environment

This Chapter describes the GUI of the Roaming Studio. Kindly note that the discussion and the screenshots apply to the activated versions of the product (i.e. not the evaluation version), unless otherwise noted.

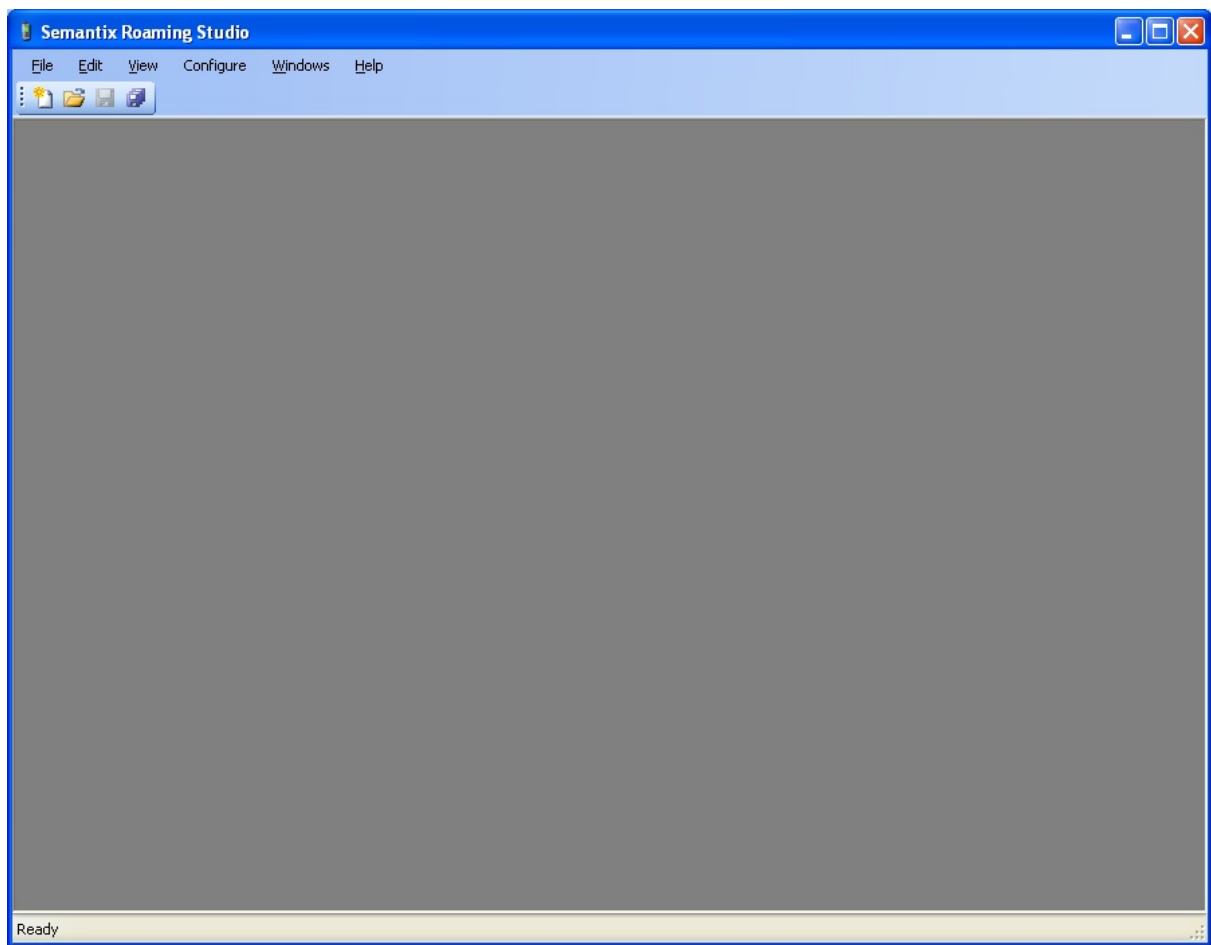
Once installed, you can launch Semantix Roaming Studio through

Start→ Programs→ Semantix Roaming Studio 2.0 → Roaming Studio



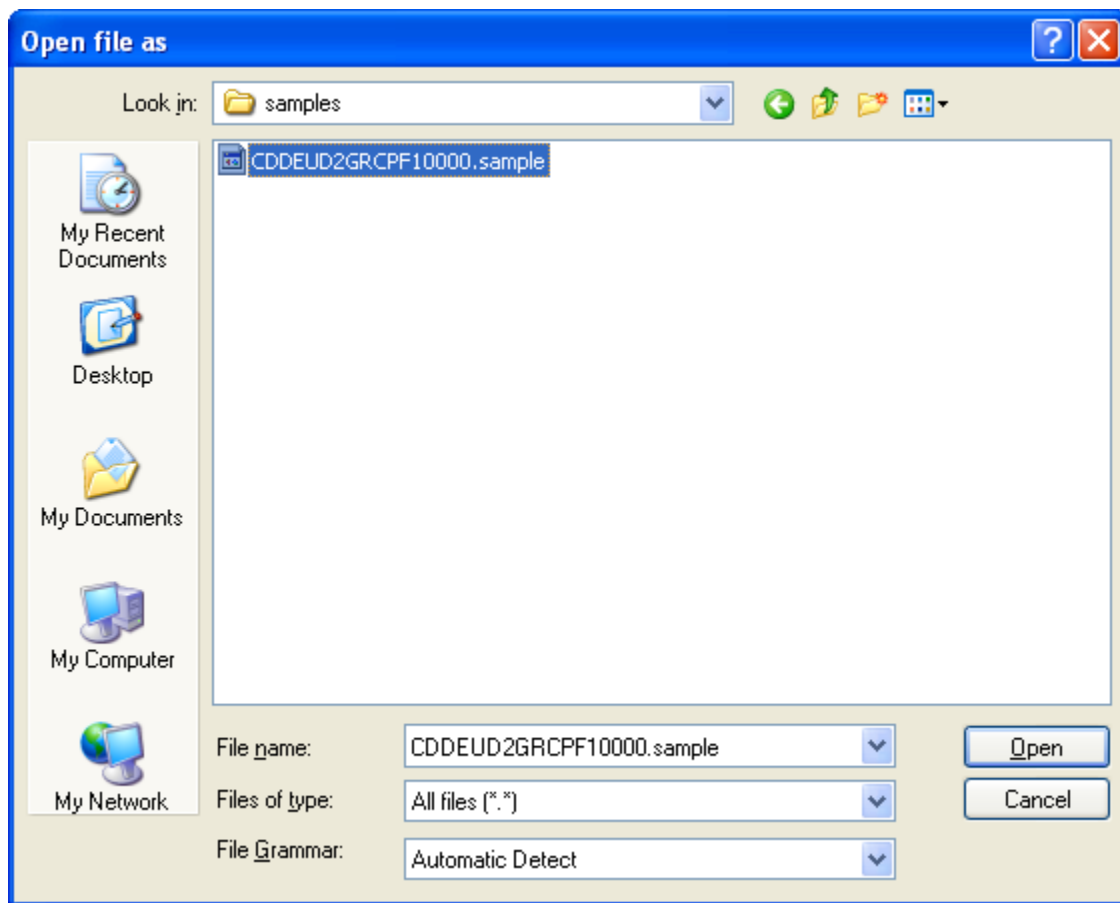
Launching Roaming Studio

Once launched the main application window appears on screen with no file loaded as depicted in the figure below.



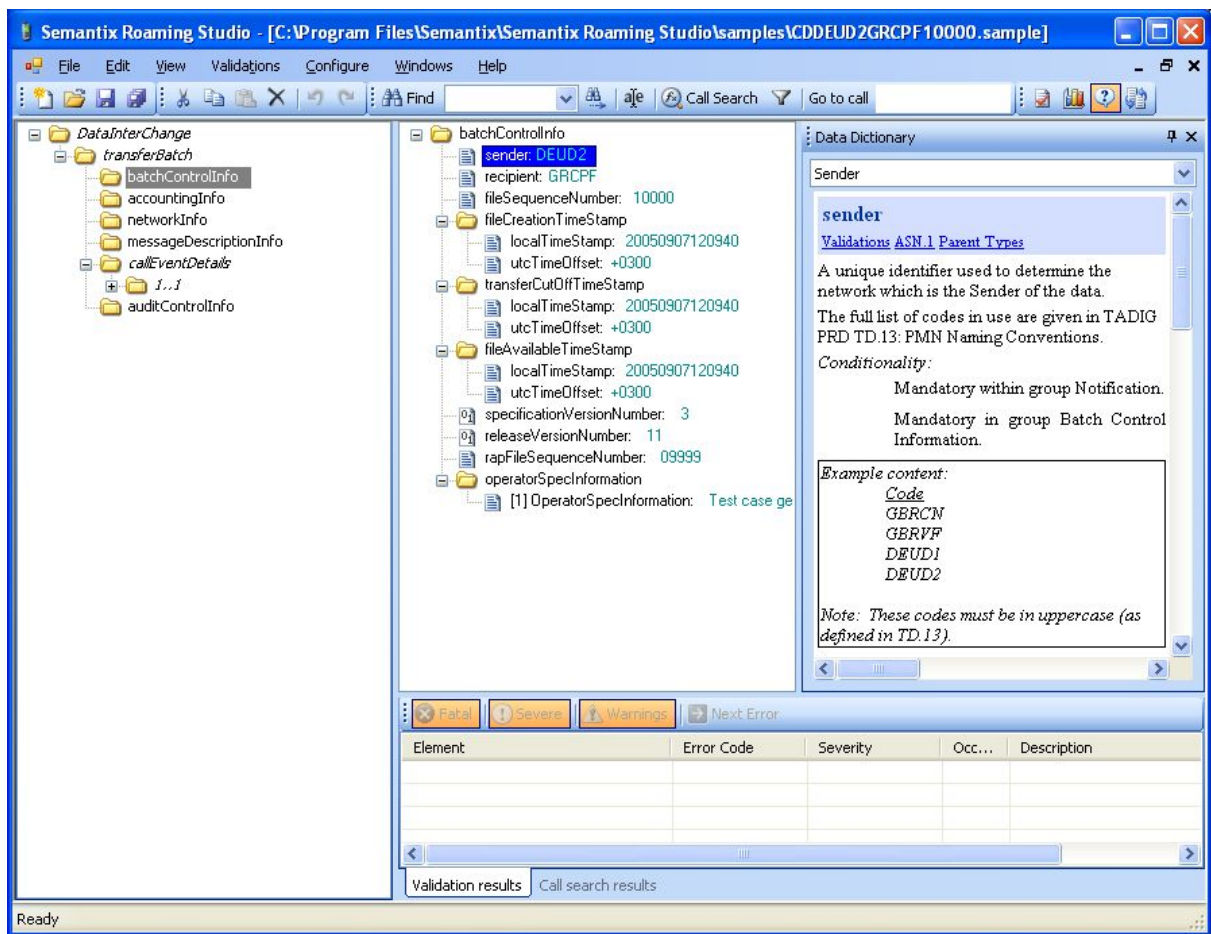
Roaming Studio main application window

To open a new file for viewing or editing, use the menu: **File** ➤ **Open**. A file dialog appears as depicted in the figure below.



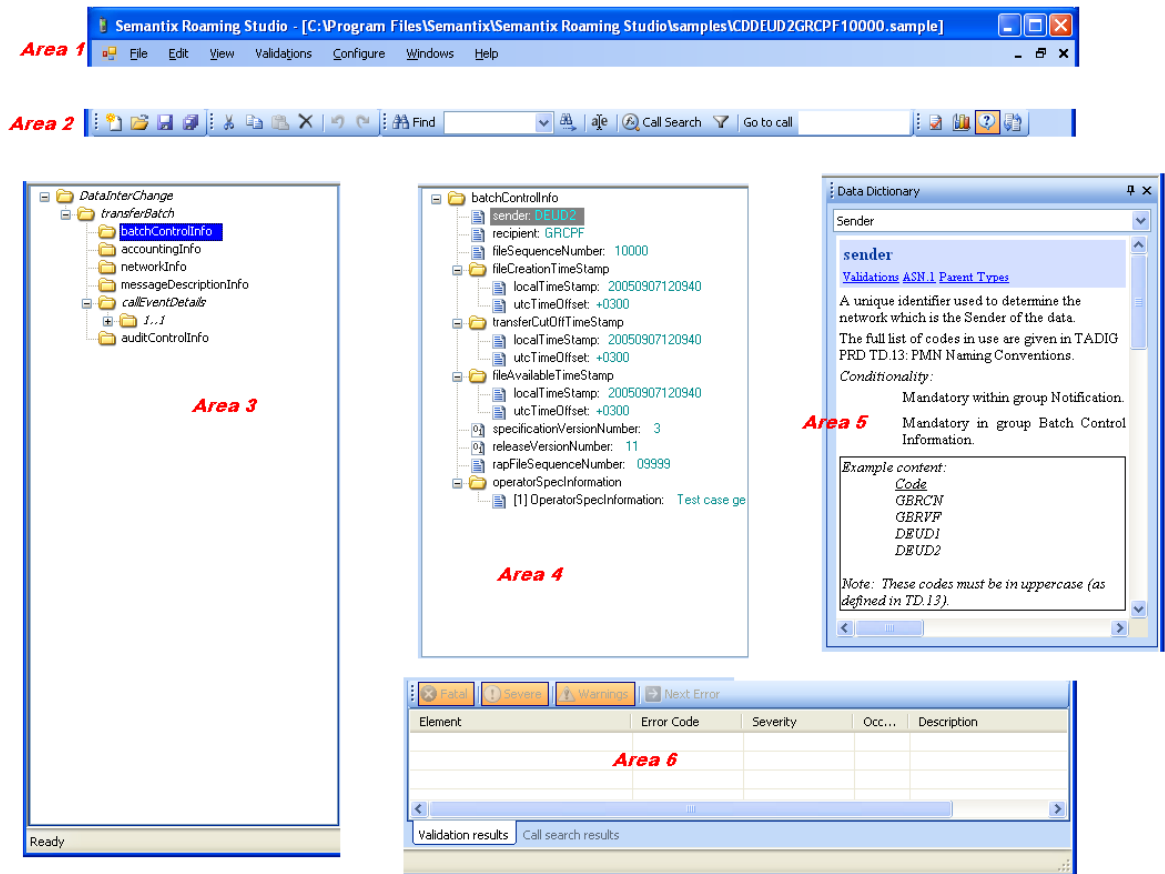
Roaming Studio File Open dialog.

When you select the file you want and press the **Open** button the TAP/RAP/NRTRDE file is read from disk and its contents are displayed on your screen. The file type is automatically detected if you leave the "File Grammar" combo box to "Automatically Detect" - otherwise, Roaming Studio will attempt to decode the selected file using the chosen format. The following figure provides a typical screenshot after the loading of a TAP file:



Typical TAP file opened in Roaming Studio

The screen of the application is divided into 6 main areas as depicted in the following figure.



Application screen areas in Roaming Studio.

The areas depicted in Figure 5 are as follows:

- Area #1 is the menu area.
- Area #2 is the toolbars area.
- Area #3 is the file view area.
- Area #4 is the call and sub-structures view area.
- Area #5 is the documentation area.
- Area #6 is the validation and call search area.

The sections that follow describe each of these areas in detail.

3.1 Main Menu Area

The main menu area contains the following menus:

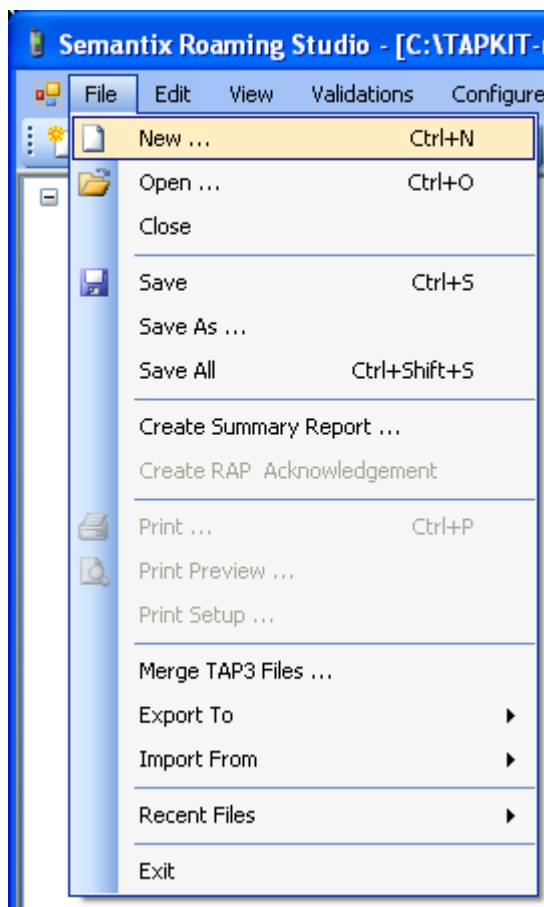
- **File** menu: contains operations for opening, creating, merging, importing, exporting files and for reporting on their contents. It is examined in subsection File Menu.
- **Edit** menu: contains operations for modifying individual fields in TAP/RAP/NRTRDE files and call

search/filter operations. It is examined in subsection Edit Menu.

- **View** menu: controls the appearance of the various toolbars and toggles on and off the main areas that comprise the screen. It is examined in subsection View Menu.
- **Validations** menu: Instructs Roaming Studio to validate the file, automatically re-compute summary fields in the file and also controls the display of fatal and severe errors (as well as warnings) allowing the user to browse through these classes of errors. It is examined in subsection Validations Menu.
- **Configure** menu: The purpose of this menu is to enable the user to configure reference data for his local Roaming Studio installation and to customize validation rules and logic in a custom, client-specific manner. It is examined in detail in subsection Configure Menu.
- **Windows** menu: The Roaming Studio is an MDI application so the role of this menu is to expose typical commands and options that control window placement when multiple files are simultaneously opened. It is examined in subsection Windows Menu.
- **Help** menu: Used to access the online help system, search help contents and display the about dialog. Described in subsection Help Menu.

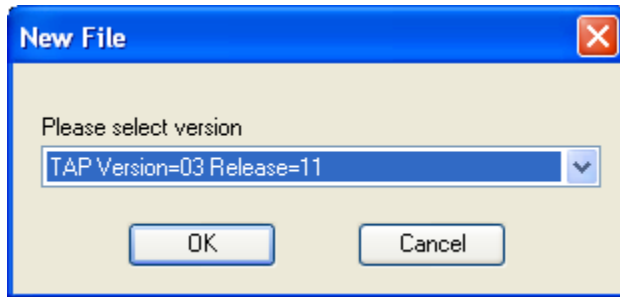
3.1.1 File Menu

As shown in the figure below, the File menu contains the following menu items and sub-menus:



The File menu

- **New ...:** Creates a new, empty TAP/RAP/NRTRDE file (allowing the user to first select the version desired):



- **Open ...:** A standard file dialog pops up allowing the user to choose a TAP/RAP/NRTRDE file to open.
- **Close:** Closes the currently opened TAP/RAP/NRTRDE file
- **Save:** Saves the currently opened TAP/RAP/NRTRDE file on the same location it was read from.
- **Save as ...:** A standard file dialog pops up allowing the user to choose the name and the directory where the currently opened TAP/RAP/NRTRDE file is to be saved.
- **Save All:** All opened TAP/RAP/NRTRDE files are saved in their original locations.
- **Create Summary Report ...:** A summarizing report in RTF format is created for the topmost TAP file currently opened in Roaming Studio. The report is opened as a separate window of the Roaming Studio application and upon its creation the initially disabled **Print ...**, **Print Preview...** and **Print Setup...** menus become operational allowing the user to print the report as depicted in the following figure:

Semantix Roaming Studio - [FileSummary Report :C:\TAPKIT\SampleData\3.10\CDDEUD2GRCPF10000.fu...

File Edit View Configure Windows Help

**Summary Report for C:\TAPKIT\SampleData\3.10
\CDDEUD2GRCPF10000.full.tap310**

Report generated by *SEMANTIX Roaming Studio*,
on Mon Jun 26 11:34:43 2006

Cut off Timestamp	20050907120940 +0300
Creation Timestamp	20050907120940 +0300
Available Timestamp	20050907120940 +0300
Intern. Access Code	00
Country Code	49
Local Currency	EUR
Total calls	8
Total charges	4
Total taxes	0.4
Total discounts	0.008
Earliest call	20050907100940 +0300
Latest call	20050907100940 +0300

	<i>Calls</i>	<i>Charges</i>	<i>Taxes</i>	<i>Discounts</i>
Mobile Originated Call	1	0.5	0.05	0.001
Mobile Terminated Call	1	0.5	0.05	0.001
Supplementary Service Event	1	0.5	0.05	0.001
Value Added Service	1	0.5	0.05	0.001
Service Centre Usage	1	0.5	0.05	0.001
GPRS Call	1	0.5	0.05	0.001
Content Transaction	1	0.5	0.05	0.001
Location Service	1	0.5	0.05	0.001

Ready

A typical summary report created from the File menu

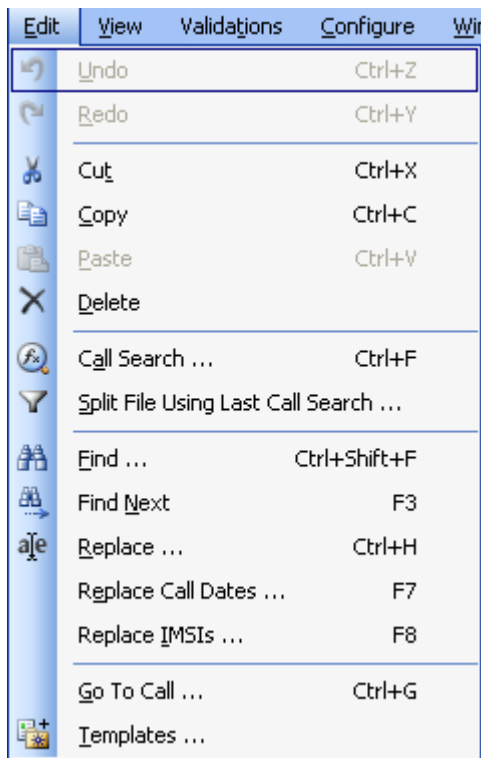
- **Create RAP Acknowledgment:** (available only when a RAP file is opened) Selecting this option will create a RAP file acknowledgment, after asking for some additional information through the following dialog:

Extra information needed for RAP file acknowledgment

- **Print ...:** (Enabled only when a report is opened in Roaming Studio) As expected, it allows you to print the report.
- **Print Preview ...:** (Enabled only when a report is opened in Roaming Studio) Preview a report you are about to print.
- **Print Setup ...:** (Enabled only when a report is opened in Roaming Studio) Displays a typical print setup dialog for the report you are about to print.
- **Merge TAP3 Files ...:** Displays a dialog that enables the user to merge two or more TAP3 files of the same TAP3 release (e.g. 3.10) into a single TAP3 file of the same release. See section Merging TAP files for more.
- **Export To:** The export sub-menu (enabled only when a file is opened in Roaming Studio) allows the user to
 1. Convert a TAP file to another TAP release (Converting TAP files to other TAP versions)
 2. Convert a TAP file to NRTRDE
 3. Export a file to XML (Importing / Exporting files from / to XML)
 4. Remove personal data, i.e. anonymize it (Anonymizing files)
 5. Export a NRTRDE file to an ASCII format (Exporting NRTRDE files into ASCII).
 6. Export a file to Excel/CSV (Exporting files to Excel/CSV)
- **Import From:** The import sub-menu allows the user to create a TAP/RAP/NRTRDE file by importing its data from an XML (Importing / Exporting files from / to XML) based file.
- **Exit:** Asks the user whether to save any modified files and exits the application.

3.1.2 Edit Menu

As shown in the following figure, the Edit menu contains the following menu items and sub-menus:



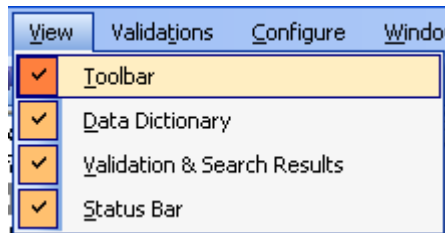
The Edit menu

- **Undo:** Undo last editing action. Roaming Studio supports unlimited undos (to be precise, as many as there is enough free memory).
- **Redo:** Redo last editing action
- **Cut:** Cut an individual field or composite structure and copy it in the clipboard
- **Copy:** Copy an individual field in the clipboard
- **Paste:** Paste an individual field or composite structure from the clipboard. Editing and copy-paste or cut-paste operations are also supported across files – provided of course they are of the same version (e.g. TAP 3.11).
- **Delete:** Remove an individual field or composite structure without copying it to the clipboard
- **Call Search ...:** Display the advanced call search dialog and facility (Searching files)
- **Split file using last call search ...:** Create a new file containing only the calls identified in the last call search (Splitting TAP files)
- **Find ...:** Display the quick find dialog (Searching files)
- **Find Next ...:** Allow the user to browse through the calls selected by the last find operation by moving to the next call (Searching files)
- **Replace ...:** Replace values throughout the file (Replace)

- **Replace Call Dates ...:** Replace the DateTime field inside call timestamps throughout the file ()
- **Replace IMSIs ...:** Replace IMSI prefixes inside calls throughout the file ()
- **Go To Call ...:** Allow the user to jump directly to a call specified by its ordinal number in the file
- **Templates ...:** Display the template management dialog that enables the users to create and maintain template for various TAP/RAP/NRTRDE structures at the call or file level for specific TAP/RAP/NRTRDE versions (Defining your own templates)

3.1.3 View Menu

The view menu as shown in the figure below consists of four menu items:

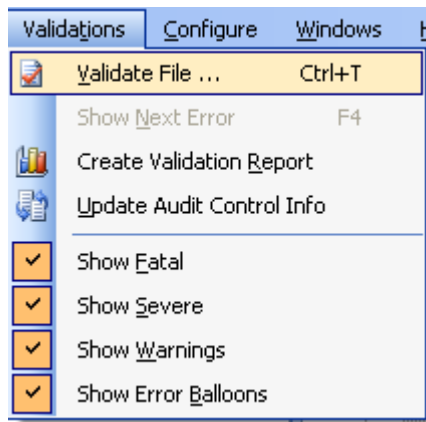


The View menu

The View menu items toggle on and off the display of the **toolbar**, the documentation area (**Data Dictionary**), the validate and search results area and the status bar.

3.1.4 Validations Menu

The Validations menu is enabled for TAP3 and NRTRDE files and is shown in the following figure:



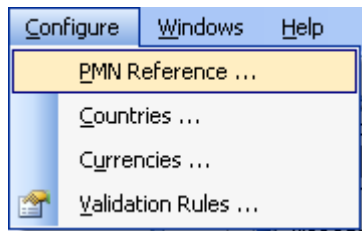
The Validations menu

- **Validate File ...:** Validates the file (Validating TAP/NRTRDE files)
- **Show Next Error:** Moves to the next validation error (Validations Results Pane)
- **Create Validation Report:** Validates the file and generates a report with all the results (Validation Reports)

- **Update Audit Control Info/Update Call Events Count:** For TAP files, updates all the Audit Control Info summary fields re-computing them from the actual call data in the file (irrespectively of any existing Audit Control Info sums). For NRTRDE files, it updates the Call Events Count field. (Updating AuditControlInfo)
- **Show Fatal:** Toggles on and off displaying of fatal errors
- **Show Severe:** Toggles on and off displaying of severe errors
- **Show Warnings:** Toggles on and off displaying of warnings
- **Show Error Balloons:** Toggles on and off displaying of error balloons

3.1.5 Configure Menu

The Configure menu is shown in the following figure:

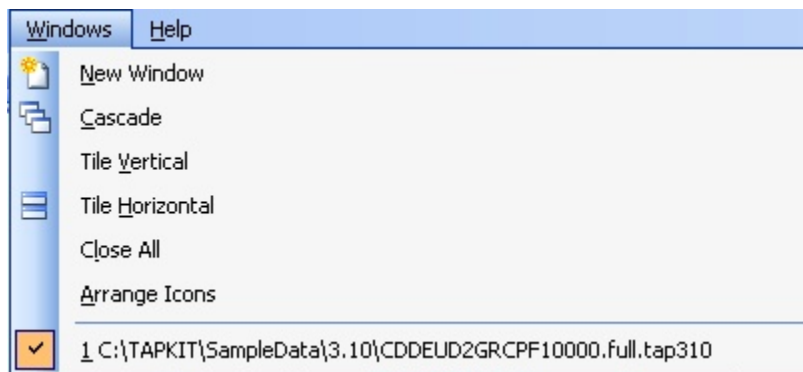


The Configure menu

- **PMN Reference ...:** Displays the PMN reference data maintenance dialog (Configuring Other Networks)
- **Countries ...:** Displays the Countries reference data maintenance dialog (Configuring Countries)
- **Currencies ...:** Displays the Currencies reference data maintenance dialog (Configuring Currencies)
- **Validation Rules ...:** Displays the Validation Rules customization dialog (Overriding Default Validation Logic)

3.1.6 Windows Menu

The Windows menu (depicted below) contains a set of typical menu items used in all windows MDI (Multiple Document Interface) applications to control the layout of opened child windows (TAP, RAP and NRTRDE files in our case).

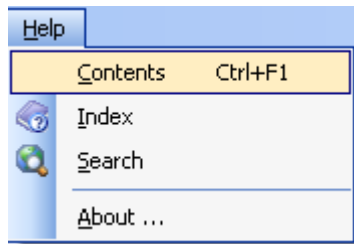


The Windows menu

3.1.7 Help Menu

The Help menu (depicted in the figure below) contains the following menu items:

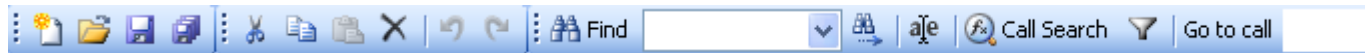
- **Contents:** Navigates to the Help file contents
- **Index:** Navigates to the Help file index, allowing the user to search the help file for keywords
- **Search:** Navigates to the Help file search, allowing the user to search the help file for anything



The Help menu.

3.2 Toolbars Area

Through the toolbar area, the user can quickly select an action:



Toolbar buttons

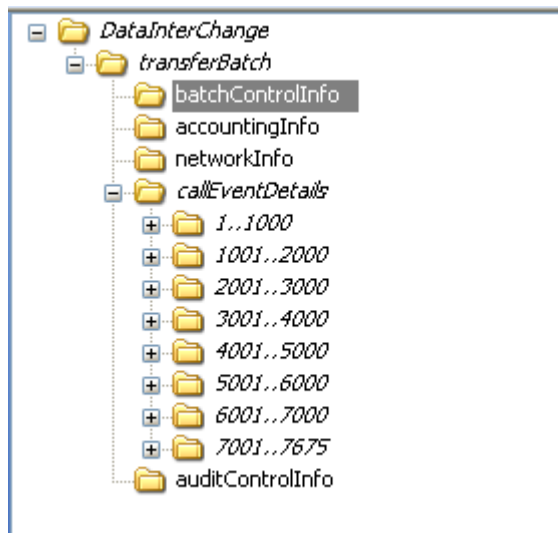
From left to right, the icons are organized in groups and are equivalent to the following menu items:

- **File/New**
- **File/Open**
- **File/Save**
- **File/Save All**
- **Edit/Cut**
- **Edit/Copy**
- **Edit/Paste**
- **Edit/Delete**
- **Edit/Undo**
- **Edit/Redo**
- **Edit/Find**

- Edit/Find Next
- Edit/Replace
- Edit/Call Search
- Edit/Split File Using Last Call Search
- Edit/Go To Call
- Validations/Validate File
- Validations/Create Validation Report
- Validations/Enable Error Balloons
- Validations/Update Audit Control Info

3.3 File View Area

The file view area displays the top-to-bottom main structure of the currently opened file:



File View area

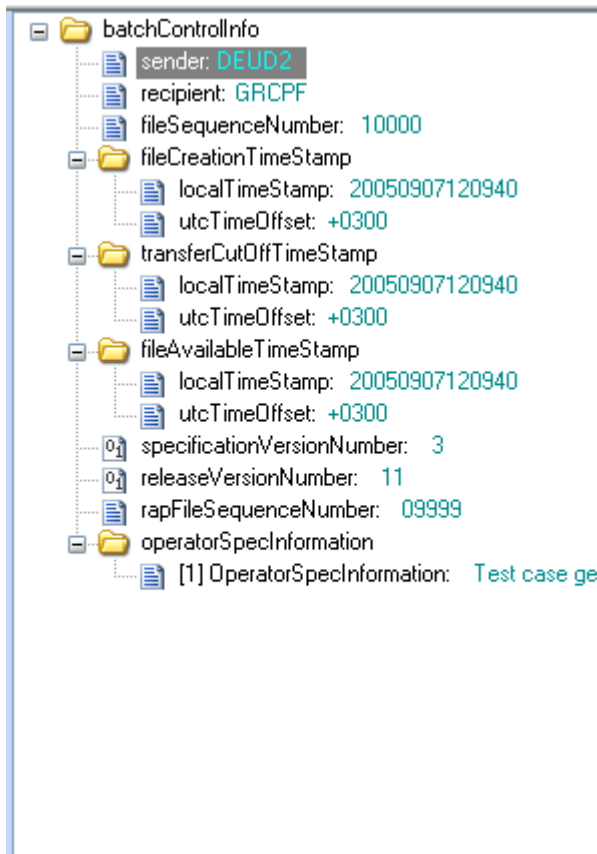
For TAP3 files, with the exception of **callEventDetails**, all the nodes directly underneath **transferBatch** are file-wide nodes; that is, they contain information about the file as a whole: lookup tables (for example for *taxCodes*, *recEntityCodes*, *discountCodes*, etc) as well as aggregate summaries in **auditControlInfo** (total number of *CallEventDetails*, etc). **callEventDetails** instead collects all the roaming information about the calls made - including the table-referencing codes that are defined in the file-wide nodes. If the file contains more than 1000 calls, then they are split in groups

of 1000 that hung directly under ***callEventDetails***.

As soon as you click on a node containing leaf nodes in the File View (a node NOT displayed in *italics*), the selected node appears in the Detail View (Detail View Area)

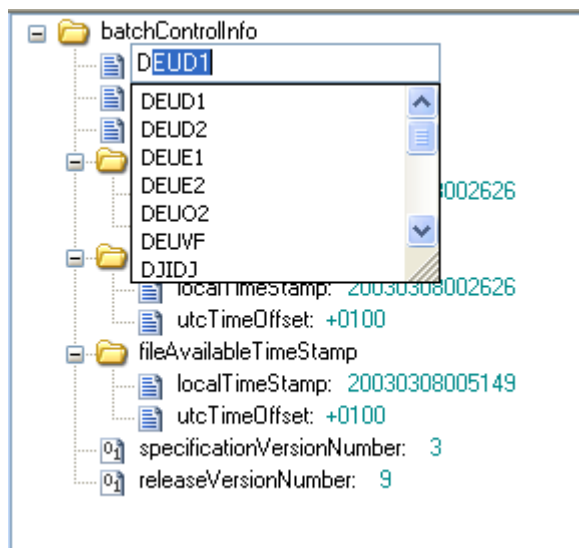
3.4 Detail View Area

The Detail View displays information about any node containing leaf nodes (INTEGERS, OCTET_STRINGS). It displays information only when a node is selected on the File View area (the one on its left). It is through the Detail View area that the user actually performs any editing of values on the tree.



Detail View area

The user can select nodes either by clicking with the mouse or by navigating through the up/down/pageUp/pageDown cursor keys. Changing the value of a node is easy: hitting F2 (or Right-clicking and selecting Edit) shows an edit box allowing the user to change the value. If the node can only take one of a set of values (according to the validation rules) then the user is also enjoying auto-complete drop-down combo boxes, like the one below (see also Adding or removing individual fields):

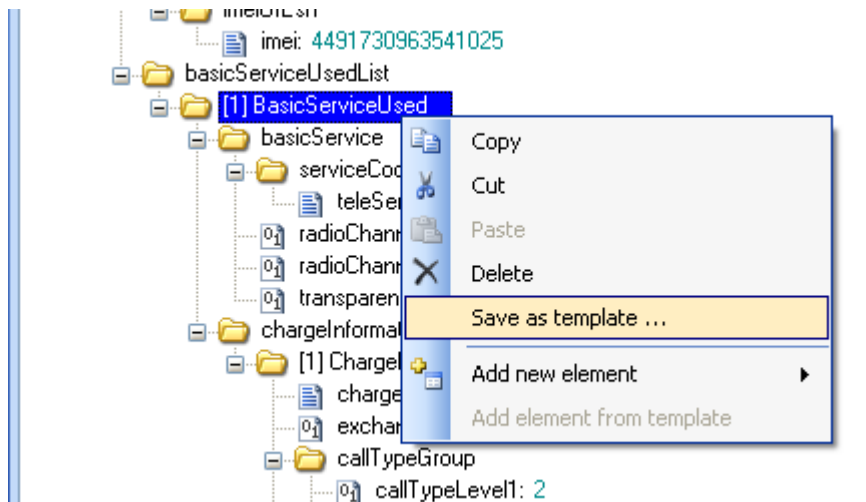


Node-aware editing

The values entered must obey the rules of the grammar: entering a string (e.g. "ABC") where an INTEGER is expected causes an error message.

A similar error occurs if a BCDString (like lmsi) is edited to contain letters (whereas it should only contain digits). The Data Dictionary (displayed in the Documentation Area) helps by showing you information about the currently selected element.

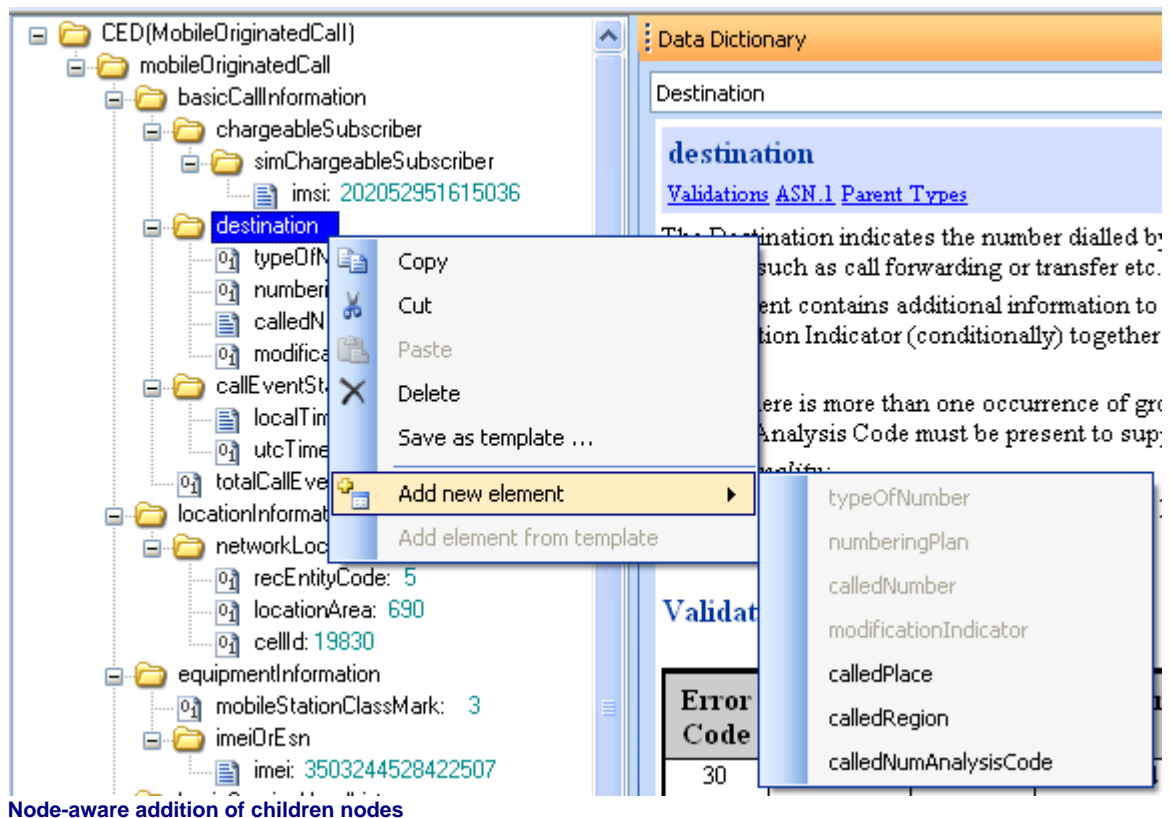
Right-Clicking on a node allows the user to save the selected subtree as a template, for later re-use (see Defining your own templates):



Saving a template for late re-use

Deleting, cut, copy and paste also work as expected.

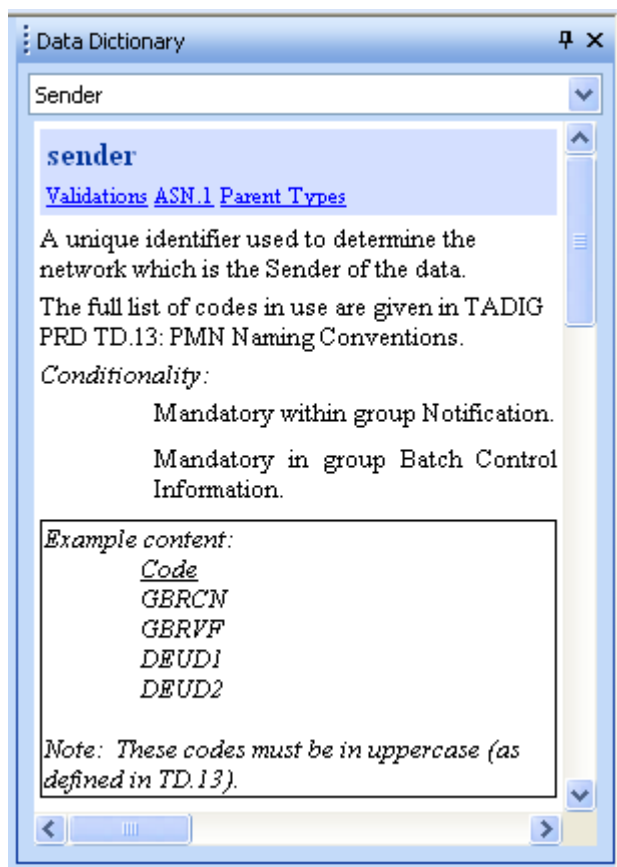
When a non-existing element is to be inserted, the editor helps by showing exactly what is missing. Right-clicking on a node and selecting "Add new element" shows a menu with the elements (if any) that are missing and can be added:



As mentioned before, the currently selected node dictates what information appears in the Documentation Area: as soon as a node is selected, all the relevant information (including the validation rules for the node) will appear in the Documentation Area.

3.5 Documentation Area

As soon as a node is selected in the Detail View area, the Documentation area is immediately updated to display all the relevant information from the appropriate TD.57 / TD.35 or TD.32 standard (according to the file's TAP release number, if it is TAP file, according to TD.35 if it is a NRTRDE file and according to TD.32 if it is a RAP file):



Data dictionary - main description

This allows the user to quickly read about what information the node contains as well as how the node is to be validated.

Furthermore, after the TD information (scrolling down with the scrollbar might be necessary) the Documentation area displays two grammar-related information lists: the related ASN.1 definitions and the related ASN.1 Parent Types. Depending on what is being examined (an ASN.1 variable or an ASN.1 type), either the containing type or the viewed type itself appear in the same way as they are defined in the ASN.1 grammar:

ASN.1 Definition (of containing types)

[Notification](#) ::= [APPLICATION 2] SEQUENCE

{		
sender	Sender	OPTIONAL,
recipient	Recipient	OPTIONAL,
fileSequenceNumber	FileSequenceNumber	OPTIONAL,
rapFileSequenceNumber	RapFileSequenceNumber	OPTIONAL,
fileCreationTimeStamp	FileCreationTimeStamp	OPTIONAL,
fileAvailableTimeStamp	FileAvailableTimeStamp	OPTIONAL,
transferCutOffTimeStamp	TransferCutOffTimeStamp	OPTIONAL,
specificationVersionNumber	SpecificationVersionNumber	OPTIONAL,
releaseVersionNumber	ReleaseVersionNumber	OPTIONAL,
fileTypeIndicator	FileTypeIndicator	OPTIONAL,
operatorSpecInformation	OperatorSpecInfoList	OPTIONAL
}		

[BatchControlInfo](#) ::= [APPLICATION 4] SEQUENCE

{		
sender	Sender	OPTIONAL,
recipient	Recipient	OPTIONAL,
fileSequenceNumber	FileSequenceNumber	OPTIONAL,
fileCreationTimeStamp	FileCreationTimeStamp	OPTIONAL,
transferCutOffTimeStamp	TransferCutOffTimeStamp	OPTIONAL,
fileAvailableTimeStamp	FileAvailableTimeStamp	OPTIONAL,
specificationVersionNumber	SpecificationVersionNumber	OPTIONAL,
releaseVersionNumber	ReleaseVersionNumber	OPTIONAL,
fileTypeIndicator	FileTypeIndicator	OPTIONAL,
rapFileSequenceNumber	RapFileSequenceNumber	OPTIONAL,
operatorSpecInformation	OperatorSpecInfoList	OPTIONAL
}		

Parent Types

[BatchControlInfo](#)

[Notification](#)

Text extracted from GSMA TD57 standard

Data dictionary - grammar definitions when variable 'sender' is selected

Additionally, the parent types for the selected element appear at the bottom.

In the example above, the Documentation area shows the two "containing" types for variable "sender". In addition, all the related variables and types are hyperlinked to each other, allowing easy navigation in the TAP/RAP/NRTRDE grammar of the selected file. Notice that this is different from navigating the actual tree from the File View and the Detail View areas; the grammar navigation shows the user what the tree *is allowed to* contain - whereas the File and Detail area show what the file contains - nothing more.

Also notice that the unique identifier of a node is its variable name, not its type name. For example, in a TAP 3.10 file, there is a different validation ruleset for variable *fixedDiscountValue*:

Data Dictionary

DiscountRate

Values: 0.00 thru 100.00

Validations

Error Code	Context	Severity Level	Validation Description
10	Acctng	Fatal	Syntax error.
20	Acctng	Fatal	Value out of range.

ASN.1 Definition (of containing types)

```
DiscountApplied ::= CHOICE
{
    fixedDiscountValue      DiscountValue,
    discountRate           DiscountRate
}
```

"fixedDiscountValue" variable validations

...and a completely different one for its type, DiscountValue (notice the additional error code, 22):

Validations

Error Code	Context	Severity Level	Validation Description
10	Calls	Severe	Syntax error.
20	Calls	Severe	Value out of range.
22	Calls	Severe	Where the associated Discount Code relates to a Discount Rate, the Discount Value does not correspond to the Charge and Discount Rate (note that rounding rules are at the discretion of the Sender).

ASN.1 Definition

DiscountValue ::= [APPLICATION 93] AbsoluteAmount

Parent Types

DiscountApplied

DiscountInformation

Text extracted from GSM-TD57 standard

"DiscountValue" type validations

It is therefore advised to always use the variable names when navigating the Documentation area.

3.6 Validations and Call Search Area

After a validation is performed, the validation area reports any errors found (see Validating TAP/ NRTRDE files):

Fatal

Severe

Warnings

Next Error

Element	Error Code	Severity	Occ...	Description
<input checked="" type="checkbox"/> Call Event Details Count	100	Fatal	1	Value does not i
<input checked="" type="checkbox"/> Total Charge	100	Fatal	1	Value does not i
<input checked="" type="checkbox"/> Total Discount Value	100	Fatal	1	Value does not i
<input checked="" type="checkbox"/> Total Tax Value	100	Fatal	1	Value does not i

<

Validation results

Call search results

Navigating validation errors

Clicking on "Next Error" (or hitting F4) navigates to the next instance (in the TAP or NRTRDE tree) of the selected categories of errors.

The same area is also hosting the Call search results, in the adjacent pane, after a call search (see Searching files):

Call Type	Call Index	
mobileOriginatedCall	7	
mobileOriginatedCall	8	
mobileOriginatedCall	9	
mobileOriginatedCall	10	
mobileOriginatedCall	13	
mobileOriginatedCall	14	
mobileOriginatedCall	15	
mobileOriginatedCall	16	

Validation results

Call search results

Navigating Call search results

Double clicking on one of the result lines navigates to the call in question.

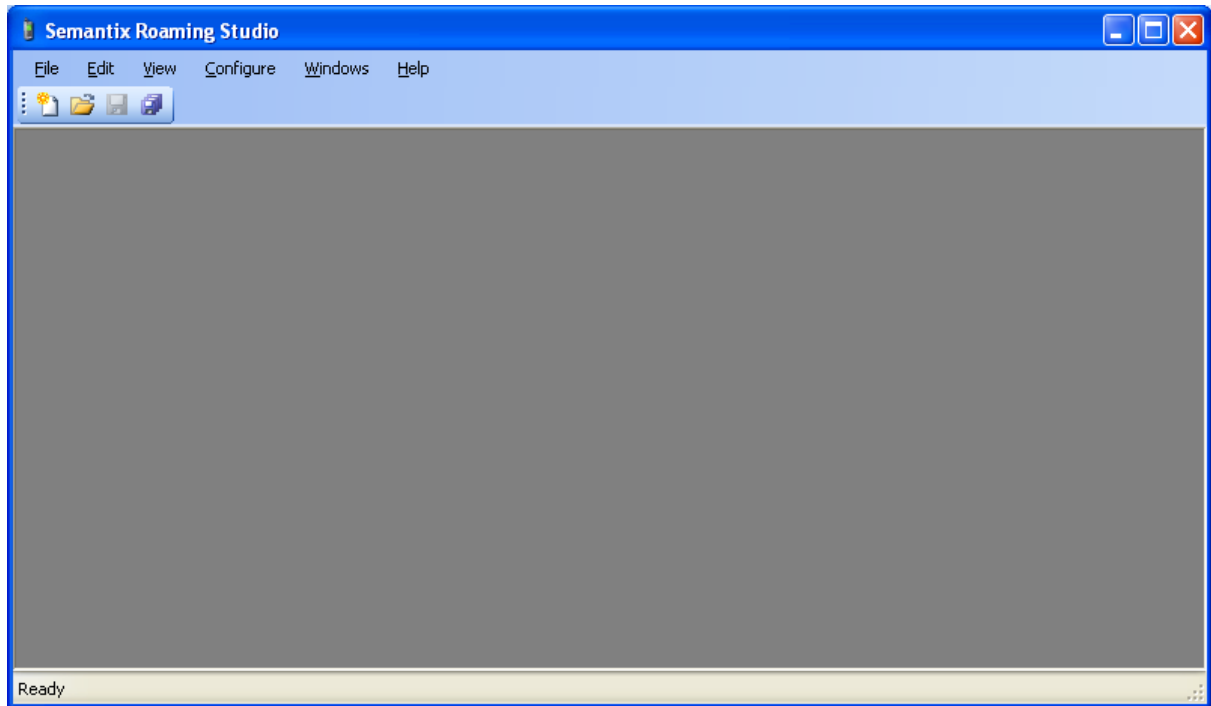
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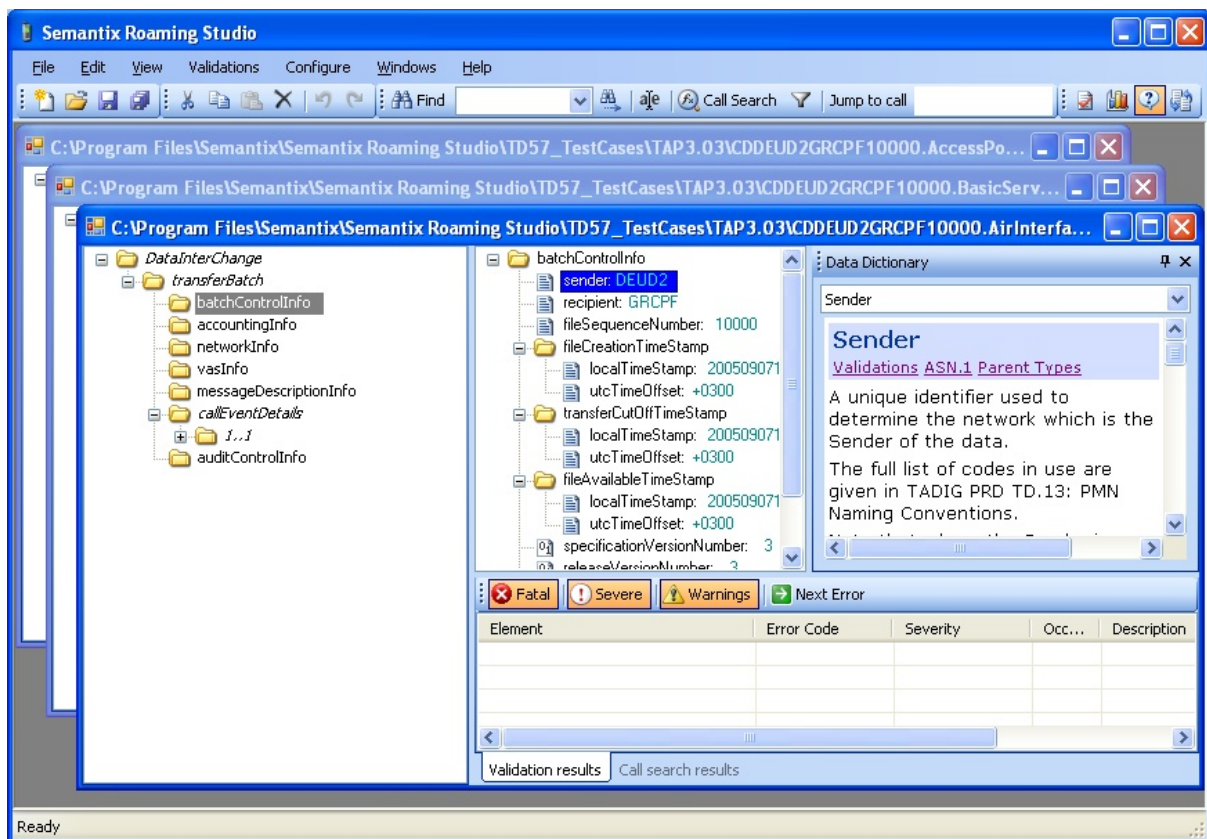
4 Viewing and Browsing files

When you first open Roaming Studio no file is loaded (as depicted in the figure below):



Roaming Studio with no file loaded

You select a file to open using the **File** ➤ **Open ...** menu which displays a standard Windows file dialog allowing you to choose a TAP/RAP/NRTRDE file to open. Since Roaming Studio is an MDI (Multiple Document Interface) application you can have many TAP/RAP/NRTRDE files simultaneously open controlling their layout through the standard menu items in the **Window** menu as depicted in the figure below.



Roaming Studio is an MDI application

The currently selected file window in the Roaming Studio (you can select another already opened TAP, RAP or NRTRDE file any time using the **Windows** menu) is displayed in the manner depicted in the figure below. To reproduce this example open some sample files provided in the TD57_TestCases folder which you can find in your installation folder (x:\Program Files\Semantix\Semantix Roaming Studio\TD57_TestCases).



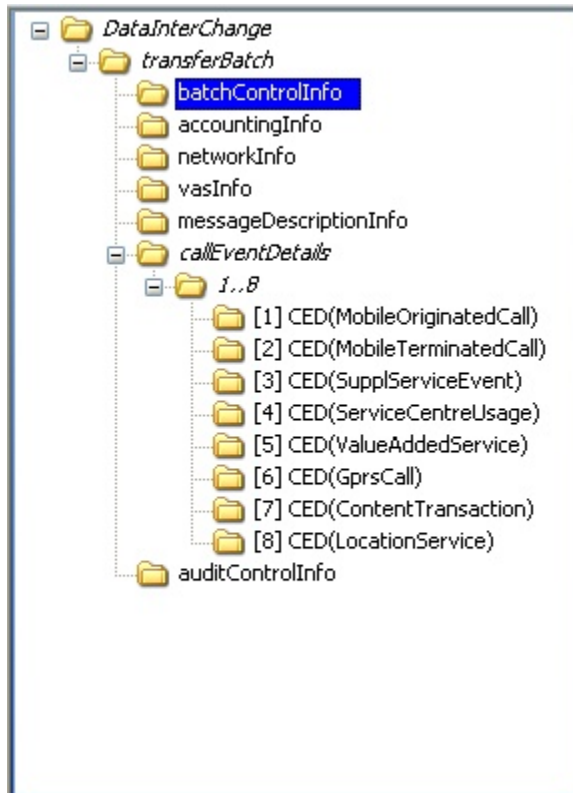
Main display areas for an opened TAP file in the Roaming Studio environment

As you can see in the figure above there are two main file data display areas: the high level display area and the detail display area. The rest of your screen area is occupied by the documentation (data dictionary) area, the validation and call search results area and the various toolbars, menu and status bars. For the purpose of this Chapter we will describe the high level display area, the detail display area and the documentation area. It is important to notice that for the most part, these three areas

move in tandem: i.e. when you click with your mouse a certain point in the high level display area, both the detail display area and the documentation area might (and probably will) change.

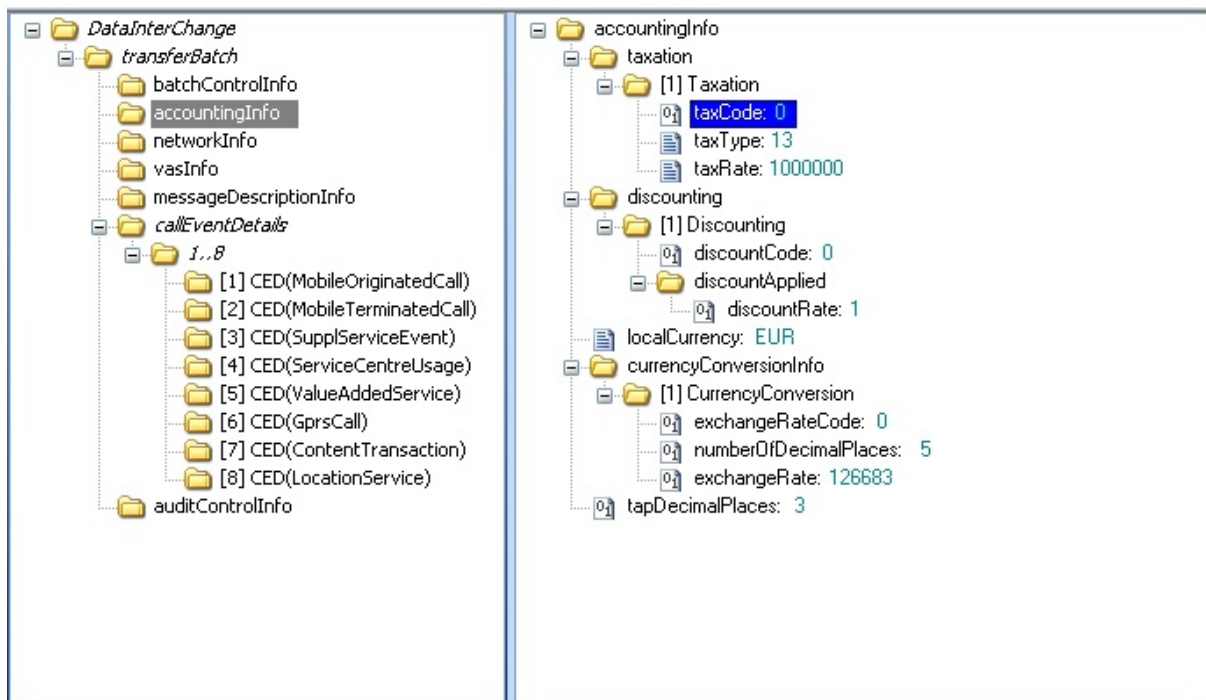
The purpose of the high level display area is to give you to a single window access to all the basic parts and structures in the TAP/RAP/NRTRDE file. It provides therefore a bird's eye view of the file and is used for high-level navigating in the TAP/RAP/NRTRDE file and not for viewing individual fields and structures. Viewing and editing individual fields is done at the detail display area.

Take a look at the high level display area pictured in the figure below.



High level display area for a sample file

If you are familiar with the internal structure of a TAP/RAP/NRTRDE file you will immediately recognize the nodes and structures displayed there. Note that a TAP/RAP/NRTRDE file is, technically speaking, a tree-like data structure stored in a file. Therefore the design of both the high level display area and the detail display area reflect that fact by using tree controls to display the arrangement of the various data structures in a TAP/RAP/NRTRDE file. You can even consider, if you find this helpful that the high-level display and the detail display areas cut through the entire tree of data structures in half as depicted in the figure below. The high level area displays the upper part and the detail area the lower parts.



The high level and the detail areas display different parts of the TAP tree

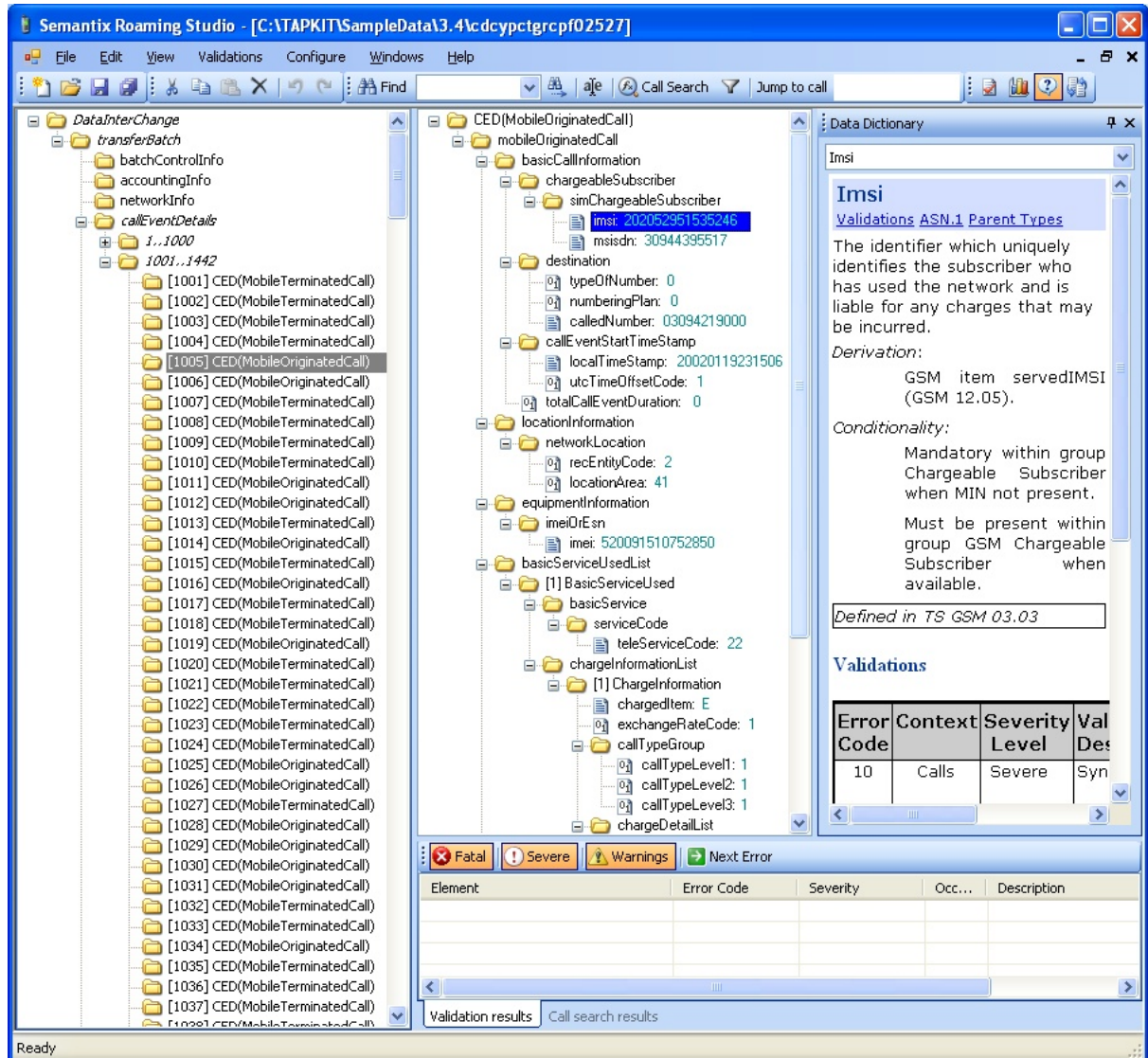
But let's get back to the high level display area. The names of the various nodes in the tree display are those found in the file-related specification: TD.57 for TAP, TD.32 for RAP and TD.35 for NRTRDE. To be more precise the names are derived from the ASN.1 grammar that is included as an appendix of each document. Both the high level display area and the detail display area use the field member names and not the field type names that are found in the ASN.1 grammar as it is these names that allow one to unambiguously identify a given field or node in the file. So for instance you have field "accountingInfo" (name of member field) and not "AccountingInfo" (name of member type). The same convention also applies to the detail display area. The SEQUENCE_OF nodes constitute an exception to this convention, since there is no variable name to use for each element of the sequence and thus, type names are necessarily used (see "[1] Discounting" in the previous example). Back at the high-level display area, the top of the tree (the "root" in technical data structure parlance) is named after its type "DataInterChange". This is the only other exception to the "variable name" convention, due to the fact that the root of the tree is the outermost node and as such it is not a member field in any node so its type name is the only name that can be used.

In both the high level and the detail area we chose the names found in the ASN.1 grammar definition (e.g. "accountingInfo") over the names used in the data dictionary descriptions (e.g. "Accounting Information") and the rest of the TD.57 document as the ASN.1 grammar is more appropriately used as a reference. The above distinction may be driving too fine a point as the names adopted in this manner are almost identical in all cases with the human-readable names that appear in the data dictionary minus the spaces. For instance, we can't think of any case where a TAP-literate user might be at a loss as to what field "networkInfo" is, assuming he understands what "Network Information" is. Even if this happens, the data dictionary (sitting right next to the Detail View area) shows the relevant TD.57/TD.35/TD.32 section, so it is literally impossible to miss-identify an element.

Regarding the high level display area there is another convention you should know about. The idea is that the node or structure selected in the high level display is displayed in detail in the detail display area. However only nodes for which it makes sense to display them in the detail display area, are displayed there. What exactly does this mean? Recall that the purpose of the high level display area is to allow for quick navigation throughout the file and that the purpose of the detail display area is to display individual fields and values and allow the user to edit them. Therefore only nodes that directly

carry a value field get displayed in the detail display area. Nodes that only carry other composite nodes don't have a detail view and are displayed in italics to signify that. This is why you have “*transferBatch*” in italics but not “batchControlInfo”. The “Transfer Batch” node carries only other subordinate composite nodes and no final “leaf” value whereas the “Batch Control Info” node carries at least some final “leaf” values like Sender and Recipient (in addition to subordinate composite nodes it itself carries like fileCreationTimeStamp and operatorSpecInformation).

Finally in order to allow easier navigation in large files, calls are grouped in thousands (in the case of large files). You have to use the mouse pointer to expand each batch of thousand calls and then select an individual call before that call's contents are displayed in the detail view area as in the figure below.

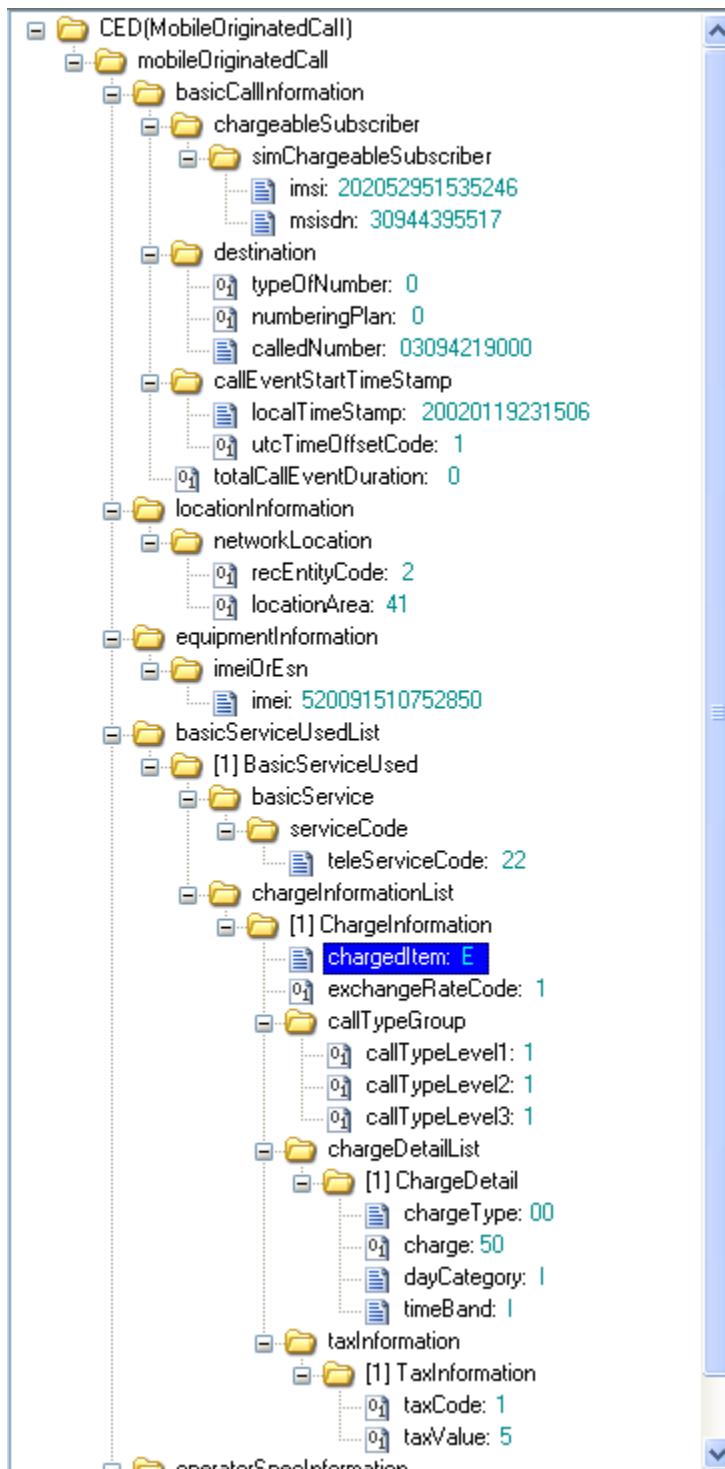


Expanding a thousand calls batch and selecting an individual call

Moreover, you can use the high level display area's vertical toolbar to scroll through large files or expand / collapse any structure to conserve on the vertical deployment of the file's data.

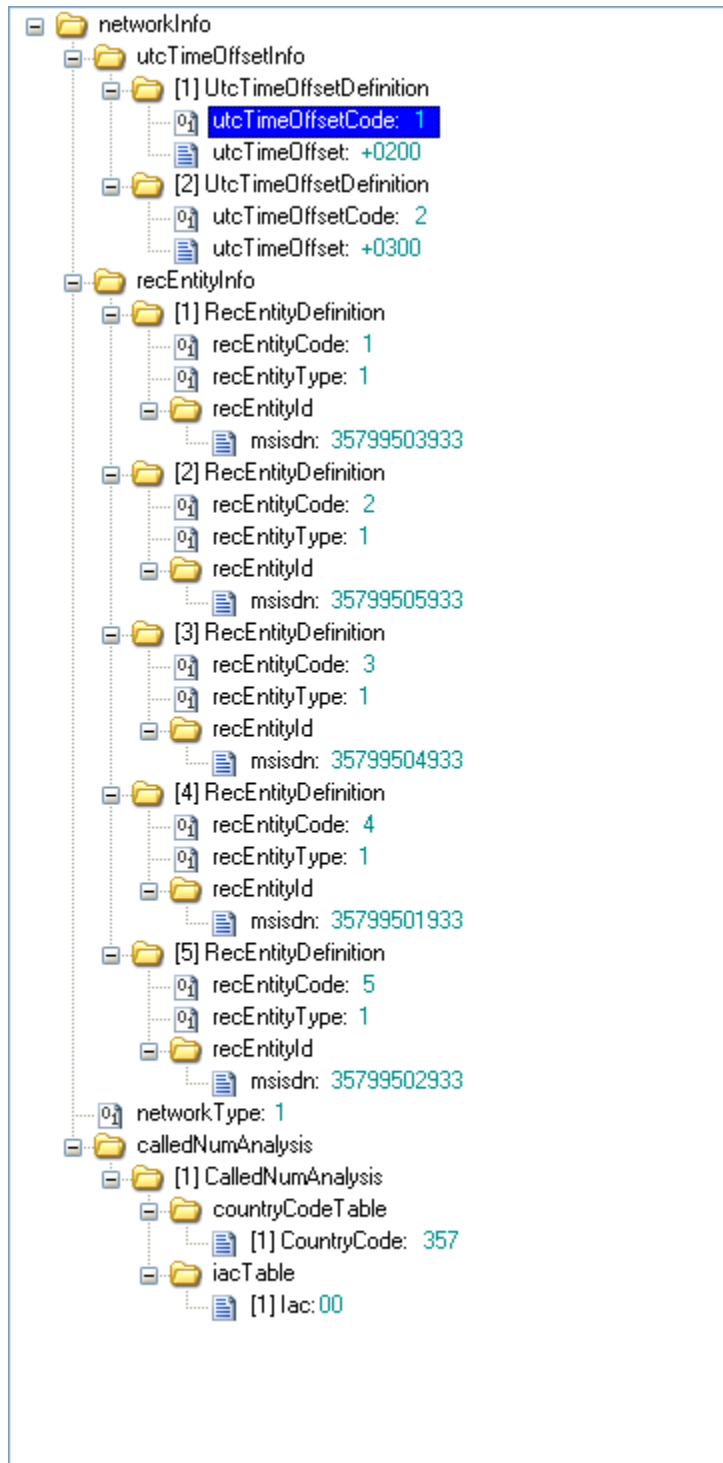
This concludes our description for viewing and browsing a file in the high-level display area. As noted above, the high-level display area, the detail display area and the documentation area move in tandem so selecting a structure or field in one area will also affect the others.

The detail display area is used to display the contents of a particular structure that is selected in the high level display area. So when a different structure is selected in the high level display area, the contents of the detail display area will also change. Structures depicted in the detail display area will be either calls as in this figure that depicts a Mobile Originated Call ...



A Mobile Originated Call displayed in the detail display area

... or other file-level structures with at least one “leaf” as in this figure that depicts a Network Info structure.



The Network Info file-level structure displayed in the detail display area

Note that as already indicated structures that contain only composite substructures and thus no “leaf” fields do not get displayed in the detail display area and are indicated in italics in the high level display

area (e.g. the Transfer Batch structure).

In the detail display area the user can view and edit individual fields. Editing is done as you might expect: by double-clicking on any individual field (or hitting F2) and typing in a new value. In so far as viewing is concerned, you can use the detail display area's vertical toolbar to scroll through the information or expand / collapse any structure or sub-tree in the detail display view to fit what you want to view in one window without needing to resort to the toolbar (just like the high level display area).

Finally, the documentation or data dictionary display area automatically displays the relevant passage from the reference data dictionary information of the appropriate TD.57/TD.35/TD.32 standard (depending on the file's format) as seen in the figure below. The information displayed there is HTML-ized allowing the user to easily browse the documentation in the relevant TD.57/TD.32/TD.35 standard for the TAP/RAP/NRTRDE file in question (see more in Documentation Area).

The screenshot shows a software interface with two main panes. The left pane displays a hierarchical tree structure of data fields. The right pane, titled 'Data Dictionary', shows the definition and values for the selected field, 'TeleServiceCode'.

Data Dictionary Content:

TeleServiceCode
[Validations](#) [ASN.1](#) [Parent Types](#)

A code which uniquely defines a TeleService.
 Group TeleService Codes, identifiable by the description 'All', should only be used where details of the specific services affected are not available from the network.
 Note that compound TeleService group codes can only occur in call independent supplementary service operations.

Derivation:
 GSM item TeleServiceCode (GSM 12.05).
 The code is derived by taking the MAP encoding (GSM TS 09.02) and translating bits 8-5 into a 'hex' character and bits 4-1 into a second 'hex' character.

Conditionality:
 Must be present within group Service Code where the type of service used was a teleservice. Must not be present when the type of service used was a bearer service and, therefore, Bearer Service Code is present.

Values:
 00 All teleservices
 10 Speech
 11 Telephony
 12 Emergency calls
 20 All SMS Services
 21 Short Message MT/PP
 22 Short Message MO/PP
 31 Advanced MHS access
 41 Videotex access profile
 42 Videotex access profile 2
 43 Videotex access profile 3
 51 Teletex (Circuit Switch)
 52 Teletex (Packet Switch)
 60 All Fax Services
 61 Facsimile Group 3 & alternative speech
 62 Automatic Facsimile Group 3
 63 Automatic Facsimile Group 4

The data dictionary display area automatically displays the relevant information depending on the selected field

Chapter



5

5 Searching files

Roaming Studio provides two ways to search in TAP/RAP/NRTRDE files: the advanced call search facility and the quick search facility. An important distinction to always bear in mind is that the advanced call search facility is a call-level search whereas the quick search facility is a field level search. What this means is that the results of the advanced call search facility is a list of selected calls (as opposed to specific fields inside each call) whereas the results of the quick search facility are field specific. So, when looping through the results of an advanced call search (see below) you are looping through calls visiting each call that matches the search criteria once whereas when looping through the results of the quick search facility you are looping through fields possibly visiting more than one field inside each call.

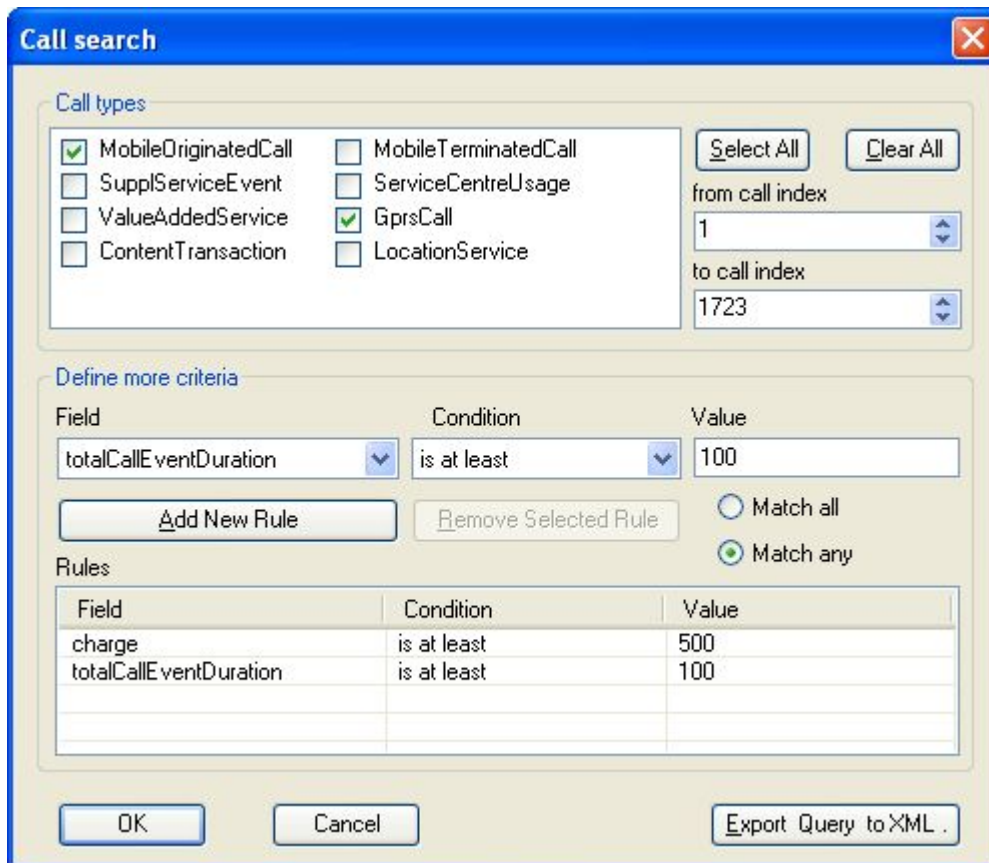
You can perform an advanced call search in three ways:

- by pressing **CTRL+F**
- by selecting **Edit ⇄ Call Search ...** from the menu
- by clicking on the **Call Search** button on the **Search & Replace** toolbar

The advanced call search facility dialog (depicted below) allows you to restrict your search to specific categories of calls (e.g. Mobile Originated Calls or GPRS calls) and to specific call indexes (e.g. between calls #100 and #200). It also allows you to examine and test in your search the value of every field you select in the file using a set of standard operators. The operators depend on the data type of the field selected and include, among others, “contains”, “is empty”, “exists”, “equals”, “is less than” (and their complementary negative operators). Using the advanced call search facility you can also create composite queries by combining simpler queries with Boolean expressions (any of the rules / all of the rules).

The advanced call search facility

As an example, we will search for Mobile Originated calls or GPRS calls whose charge exceeds 499 or whose duration exceeds 99. The following figure depicts the advanced call search dialog for this search. Since the file we are searching has 1723 calls, the dialog upon opening has already filled the call index boundaries with 1 and 1723. We only fill in the rest of the details:



Call search

Call types

☒ MobileOriginatedCall ☐ MobileTerminatedCall
☐ SupplServiceEvent ☐ ServiceCentreUsage
☐ ValueAddedService ☒ GprsCall
☐ ContentTransaction ☐ LocationService

Select All Clear All
 from call index: 1
 to call index: 1723

Define more criteria

Field: totalCallEventDuration Condition: is at least Value: 100
 Add New Rule Remove Selected Rule Match all (unselected) Match any (selected)

Rules

Field	Condition	Value
charge	is at least	500
totalCallEventDuration	is at least	100

OK Cancel Export Query to XML

An example of an advanced search

After adding the search rule (pressing the "Add New Rule" button) and then pressing the ok button, the search will be performed and the identified calls will appear in the Call Search Results pane of the Validations and Call Search area as depicted in the figure below.

Call Type	Call Index	
mobileOriginatedCall	31	
mobileOriginatedCall	86	
mobileOriginatedCall	117	
mobileOriginatedCall	164	
mobileOriginatedCall	166	
mobileOriginatedCall	177	
mobileOriginatedCall	188	
mobileOriginatedCall	201	
mobileOriginatedCall	203	

Validation results Call search results

Calls selected by the last search appear in the call search results pane

You can then loop through the selected calls by pressing **F3** or by directly double-clicking at a specific call index result in the Call Search Results pane.

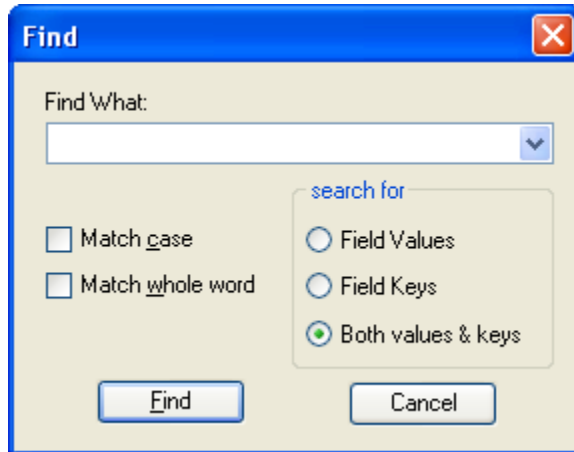
Sometimes though you just need to perform a quick-and-dirty search for a given string or number and find all of its occurrences in the file irrespectively of the field. The quick find search was implemented for this purpose.

You can perform a quick find search in the following ways:

- By pressing **CTRL+SHIFT+F**

- By selecting **Edit ▾ Find** from the menu
- By using the Find button on the toolbar

Pressing the **CTRL+SHIFT+F** keys, selecting the **Edit ▾ Find** command from the menu or clicking on the Find button on the toolbar display the Find dialog depicted in the figure below.



The Find dialog

Using this dialog the user has the option to perform a case sensitive or insensitive search for a full string or a sub-string in the field names or field values of a file. Note that the find dialog can also be used to find field names (as opposed to field values) or both field names and values when the **Values & Keys** radio box is selected.

You can also use the text box next to the Find button on the toolbar to enter a new value and press enter to perform a new search (with the last quick find settings and the new value).

As in the case of the advanced call search, pressing the **F3** key or clicking on the **Find Next** button on the toolbar will allow you to loop through all selected fields. However, a find operation won't display its results in the **Call Search Results** pane of the **Validations and Search** area – this pane is used to hold the results of the last call search only.

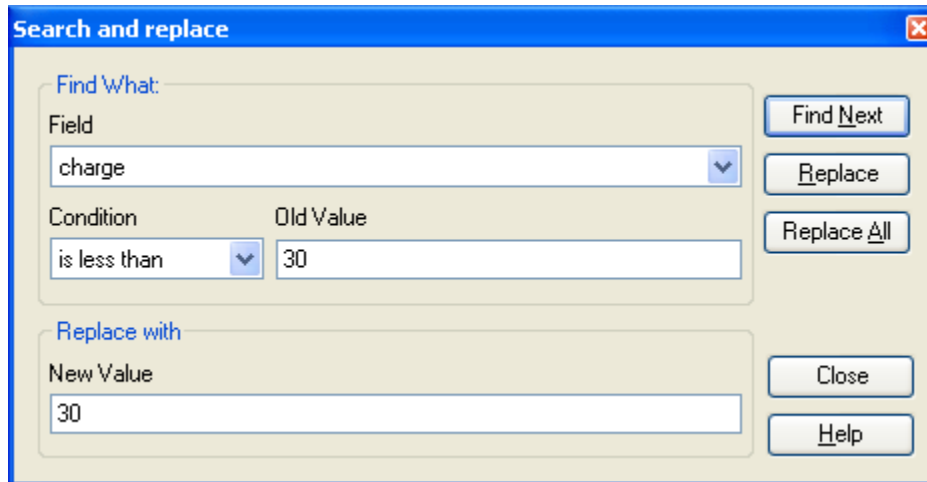
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6 Replace

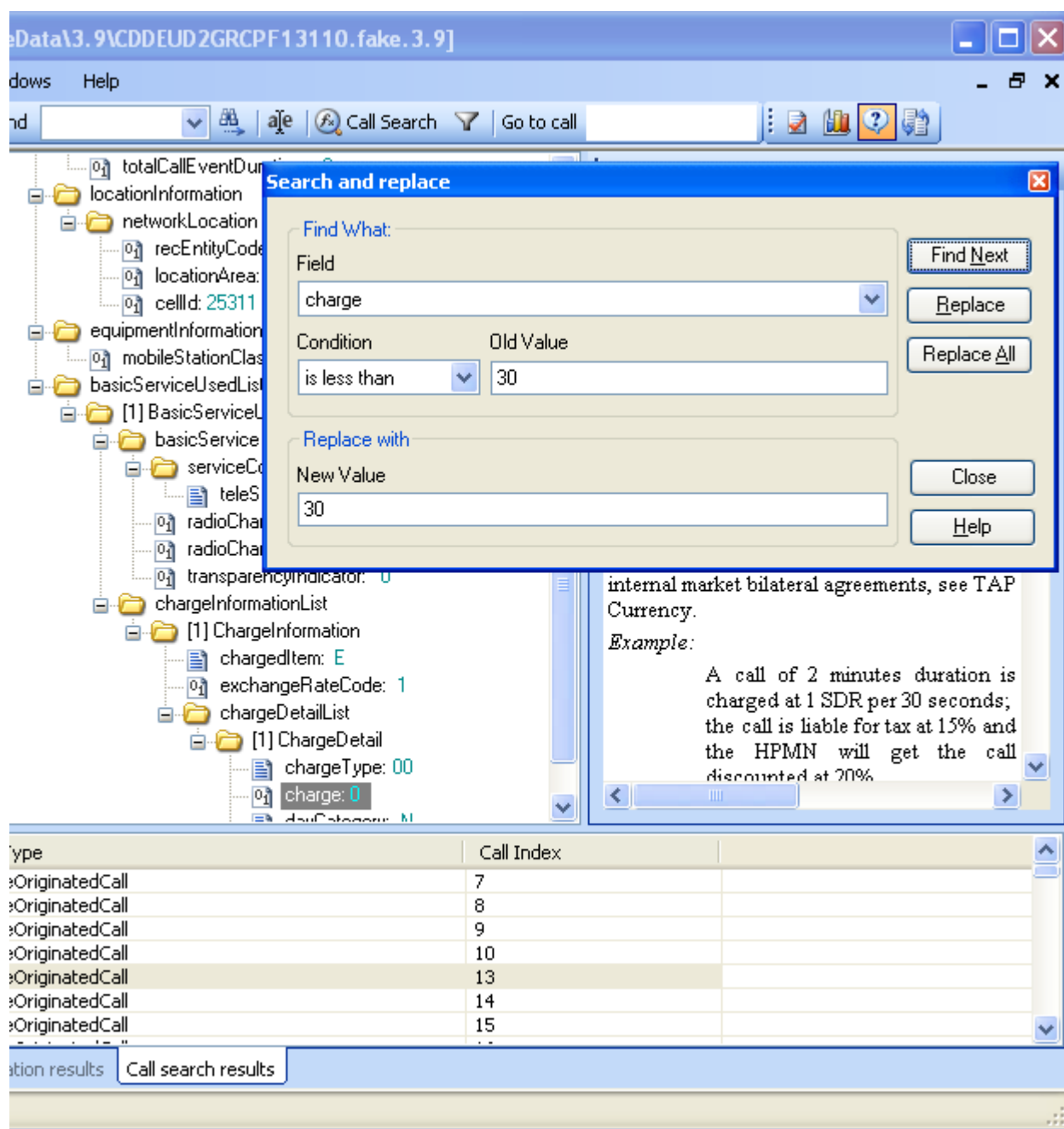
Choosing "Edit/Replace" from the menu, hitting Ctrl-H on the keyboard, or clicking on the **Replace** icon of the toolbar shows the "Search and Replace" dialog:



Search and Replace dialog

This dialog allows the experienced user to search for all instances of an ASN.1 node that fulfill simple search criteria and change their values. This can be done automatically (by clicking on "Replace All") or manually (by clicking on "Find Next", "Replace", "Find Next", etc). In the example shown above, the operator decided to increase their revenue by searching for all "charge" nodes containing values less than 30 and setting them to 30.

The manual search/replace mode is useful when you want to be sure you are not changing something you don't want to; each time "Find Next" is pushed, the Detail View Area is updated to show the relevant part of the tree containing the located node. This way, the user can verify that he/she indeed wants to change that particular instance of the node:



Manual search/replace

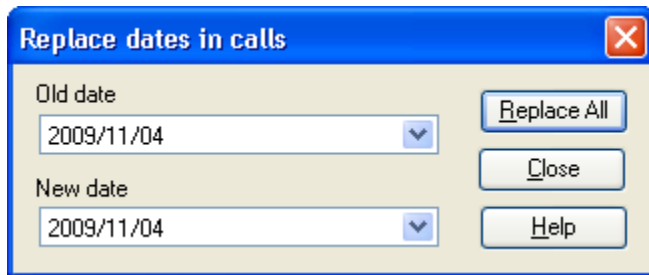
Chapter



7

7 Replace call dates

Choosing "Edit/Replace call dates..." from the menu or hitting F7 on the keyboard shows the "Replace dates in calls" dialog:



Replaces call dates dialog

This dialog allows the experienced user to search inside all calls and replace **ONLY** the date part in all timestamps (e.g. CallEventStartTimeStamp, ChargingTimeStamp, etc) from an old date to a new date.

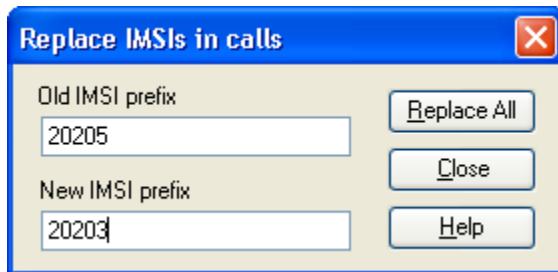
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8 Replace IMSIs

Choosing "Edit/Replace IMSIs..." from the menu or hitting F8 on the keyboard shows the "Replace IMSIs" dialog:



Replace IMSIs dialog

This dialog allows the experienced user to search inside all calls and replace **ONLY** the prefix part of the "Imsi" field. When the "Replace All" button is pressed, any call's "Imsi" field that starts with the specified "Old prefix" will be updated to use the "New IMSI prefix".

Chapter



9

9 Validating TAP/NRTRDE files

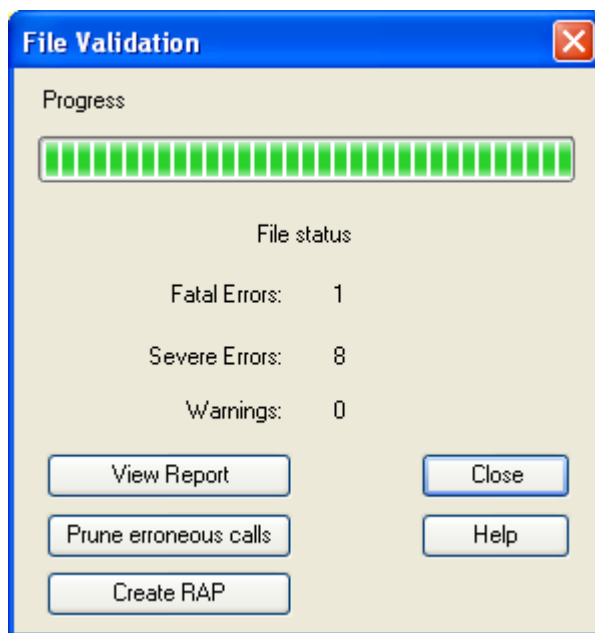
Validating a TAP/NRTRDE file refers to the process of checking it against the data dictionary validation rules of the appropriate TD.57/TD.35 specification.

You can validate a file by:

- Choosing **Validations** ➤ **Validate File** from the menu
- Pressing **CTRL+T**
- Clicking on the **Validate File** button on the toolbar

Invariably, the Validation window appears with a progress bar to monitor the progress of the validation process (it can take a few seconds on large files). Note also that it is possible to manually override the validation process by configuring your own validation profile. Validation profiles allow you to change the severity of various validation errors (e.g. from “severe” to “warning”) or to change the ranges or value sets that specific validations check for. Validation profiles are examined in Overriding Default Validation Logic.

Once validation is completed the Validation window looks like the one depicted in the figure below (for TAP files):



The validation window

The completion of the validation process has four visible / actionable results:

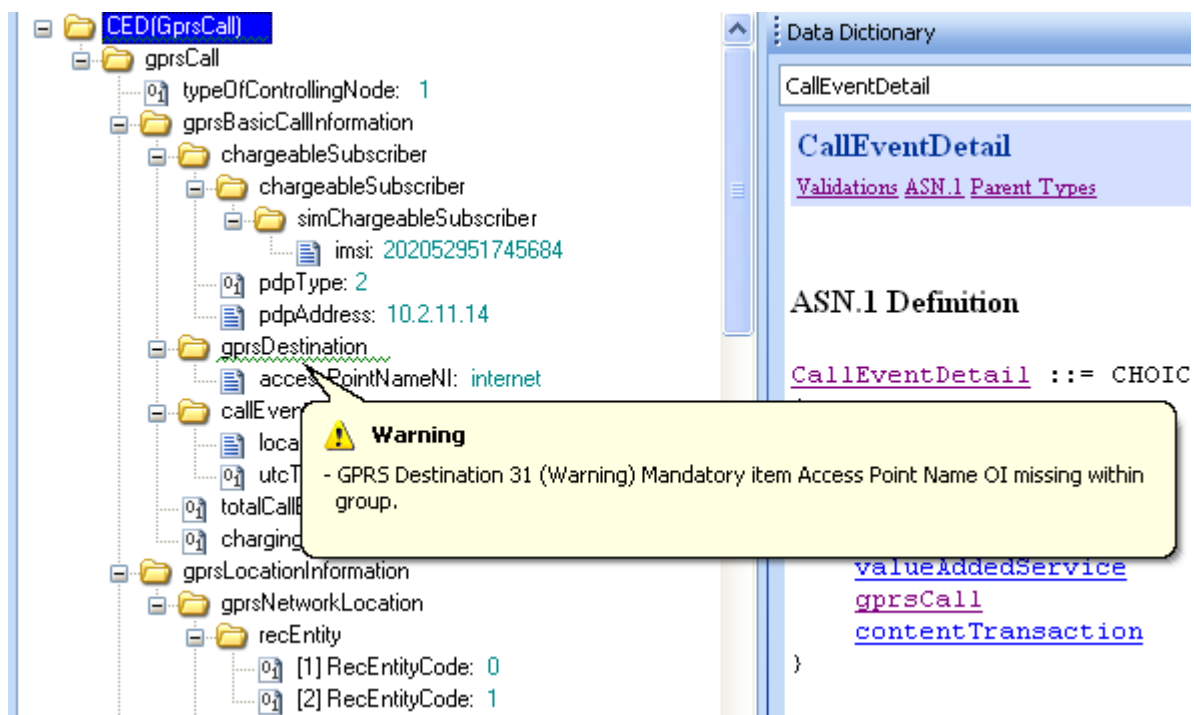
- the file's high level view area and the detail view area are re-painted to reflect fatal, severe errors and warnings
- the user is given the option to create a validation report
- the user is given the option to prune erroneous calls (if any severe errors exist)
- the user is given the option to create a RAP file with the validation errors (for TAP file validation)
- the Validation Results pane of the Validate and Search area now contains the validation results

allowing the user to navigate through them

These are detailed in the sections that follow.

9.1 Re-painting of the File and Detail View Areas

Once validation of a file is completed, the file's display in the high level and detail view areas is re-drawn. Wavy underlines are drawn below any field or call or structure (call-level or file-level) for which a fatal or severe error or a warning has been identified. Fatal errors and severe errors are indicated with a red wavy underline whereas warnings are indicated with a green wavy underline. By hovering your mouse pointer above any field that is underlined in this manner a balloon description of the validation error will appear (assuming of course that error balloons are enabled in the **Validations** \oplus **Show Error Balloons** menu item).



Validation messages appear when hovering the mouse over underlined nodes

You can also control which types of validation errors (fatal, severe errors or warnings) are indicated with wavy lines by enabling or disabling the **Show Fatal**, **Show Severe** and **Show Warnings** menu items in the **Validations** menu. Double-clicking on a specific error class listed in the tabular listing of the **Validation results** pane (see Section **Validations Results Pane**) or checking / un-checking the tick box on its left allows you to also exercise a much finer level of control by deciding which specific error cases will be identified visually with the wavy underlines. Note that enabling or disabling the **Show Fatal**, **Show Severe** and **Show Warnings** menu items of the **Validations** menu or toggling on and off specific error classes in the **Validation results** pane has another important effect beyond the painting of the wavy lines: it controls error eligibility for the **F4** loop (see Section **Validations Results Pane** for more).

9.2 Validation Reports

By pressing the **View Report** button on the **Validation** window a validation report is created as an RTF file and is opened as a separate document in the Roaming Studio MDI application using a built-in RTF viewer. An example TAP3 Validation report is depicted in the figure below:

Semantix Roaming Studio - [Validation Report : C:\TAPKIT\SampleData\3.4\dcyp...

File Edit View Configure Windows Help

Validation Report

(Generated by SEMANTIX Roaming Components, on Mon Jun 26 14:46:37 2006)

1. General Information

File Name:
 Sender: CYPCT, Cytamobile-Vodafone
 Recipient: GRCPF, vodafone
 Sequence Number: 02527
 TAP Version: TAP 3.4
 Status: SEVERE ERRORS

2. Summary

RecordType	Valid	Invalid	Valid Revenue	Invalid Revenue
MOC	583	13	95.79	8.65
MTC	846	0	0.00	0.00
SSE	0	0	0.00	0.00
SCU	0	0	0.00	0.00
VAS	0	0	0.00	0.00
GPRS	0	0	0.00	0.00
Content Transaction	0	0	0.00	0.00
Location Services	0	0	0.00	0.00
Audit Control Info	1	0		

Total calls 1442
 Total revenue 104.44
 Total warnings 0
 Total severe 1 (revenue lost is 8.65)
 Total fatal 0

3. Error Details

Severe 20 [Call Type Level 3], occurs 13 time/s.
 Value out of range.

End of Report

Ready

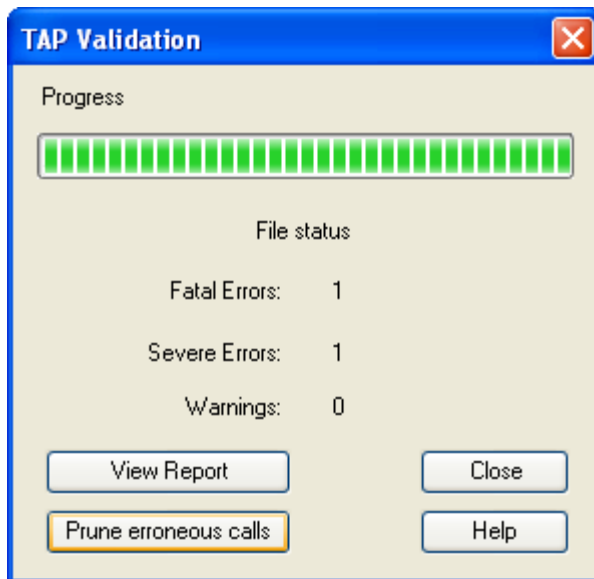
A typical validation report RTF file opened inside the Roaming Studio MDI application

Most of the Roaming Studio menu items and toolbars are disabled when a report is the top level

window whereas some menu commands that were previously disabled are now enabled allowing you to print preview (**File** \oplus **Print Preview ...**), setup (**File** \oplus **Print Setup ...**) and print the report (**File** \oplus **Print ...**). Of course you can also save it as an RTF file (**File** \oplus **Save** and **File** \oplus **Save As ...**). Finally, to go back to the file you were validating you can either close the validation report window or switch to the file window from the Windows menu.

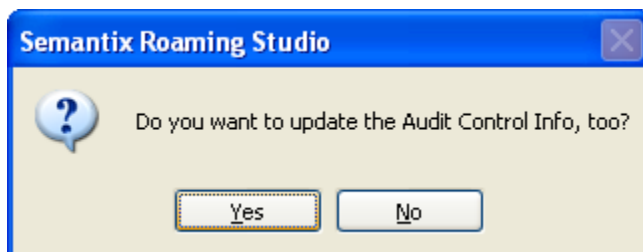
9.3 Pruning Erroneous Calls

Assuming that a file is being validated and at least one or more calls with a severe error were found, the user will be given the option to prune these calls out of the file. The user is given this option as the **Prune erroneous calls** button on the Validation window gets enabled when there is at least one severe call.



Pruning erroneous (severe) calls

Deleting one or more of the calls must be followed by re-computing some file-level summary structures like the “Audit Control Information” structure. This is done automatically without the user having to do anything beyond agreeing to the following dialog:



Confirmation dialog for pruning of TAP3 severe calls

The user can also manually request a recalculation of the summary fields through the **Validations** \oplus **Update Audit Control Info** menu. Through this update, the pruning operation is guaranteed to not introduce any discrepancies (usually a fatal error) in the file and yield a correct file (assuming of course

the initial file had no fatal errors of its own).

However, it should be noted that the pruning operation will not and cannot in any way fix any fatal errors. Calls with severe errors will be removed so the new file will not contain any severe errors but pre-existing fatal errors or warnings will remain unaffected by the pruning process. Moreover, in many cases it may not be appropriate to prune severe calls out of a file when that file also contains fatal errors. The reason is that the validation logic is such that in many cases a fatal error in a file-level field or structure can result in many calls identified as severe where in fact the root of the problem is not in the calls themselves but in one or more file-level fields or structures. In these cases fixing the cause of one fatal error can commonly result in many severe error complaints removed. Therefore it is usually a good idea to try to fix any fatal errors before pruning erroneous calls (especially if you see a very large number of severe calls as this typically indicates some other more central problem with the file structure – a fatal error in many cases). Pressing the **Prune erroneous calls** button in the **Validation** window will not prevent you from pruning severe calls out of a file with one or more fatal errors – though it will issue a warning to that effect first.

Finally, it should be noted that in cases where the user manually deletes one or more calls from the file (see Adding or removing composite structures), then, updating of the summary fields must be explicitly requested by the user by selecting the **Update Audit Control Info** menu item from the **Validations** menu.

9.4 Validations Results Pane

The **Validation results** pane holds the results of the latest validation. The **Validation results** pane is depicted in the figure below.

Element	Error Code	Severity	Occ...	Description
<input checked="" type="checkbox"/> Call Type Level 3	20	Severe	13	Value out of range.

The Validation results pane

The top part of the pane consists of three toggle buttons (**Fatal**, **Severe** and **Warnings**) that can be used to toggle on and off the appearance of fatal errors, severe errors and warnings. Their effect is identical in all respects to that of the **Show Fatal**, **Show Severe** and **Show Warnings** menu items of the **Validations** menu and the two are synchronized (so when you deselect the menu item **Validations** \oplus **Show Warnings** the **Warnings** check box is also toggled off). They are used to control three things:

- the appearance of the wavy underlines in the high-level view and detail view of a file
- the participation of validation errors of this type in the navigation loop that is activated every time the users presses the **F4** key or selects the **Validations** \oplus **Show Next Error** menu item. Simply put, the easiest way to browse through all of a file's fatal errors all you have to do is to toggle off the **Severe** and **Warnings** checkboxes from the **Validation results** pane (or deselect the **Show Severe** and **Show Warnings** menu items from the **Validations** menu) and press repeatedly the **F4** key. With each **F4** key press you will be automatically navigated to the next fatal error.

- the errors that are listed in the **Validation results** pane tabular structure. Note that in contrast to the **Call search results** pane validation errors listed in the **Validation results** pane are not clickable: i.e. you cannot double click on an error and jump to its occurrence. This is because the **Validations results** pane aggregates errors of the same type so double clicking on a error line in the list is actually double-clicking on a class of similar errors and as such it can't get you anywhere specific in the file. Actually, double clicking on an error class does have an effect which is this: it toggles on and off the participation of that error class in the **F4** error browsing loop. So not only can you select whether you want to browse through severe, fatal errors or warnings in your **F4** loop (as described in the previous bullet) but you can also select which particular fatal or severe errors or warnings will participate in that loop. In this table listing the following information is identified for each validation error:
 - **Element**: the name of the element under whose entry in the data dictionary of the relevant TD.57 specification is each error described
 - **Error Code**: the error code for that validation in the data dictionary description for the relevant element (see above) in the applicable TD.57 specification document
 - **Severity**: one of "fatal", "severe" or "warning"
 - **Occurrences**: how many times this error appears in the validated file
 - **Description**: the description provided for this error in the data dictionary of the relevant TD.57 specification.

Chapter



10

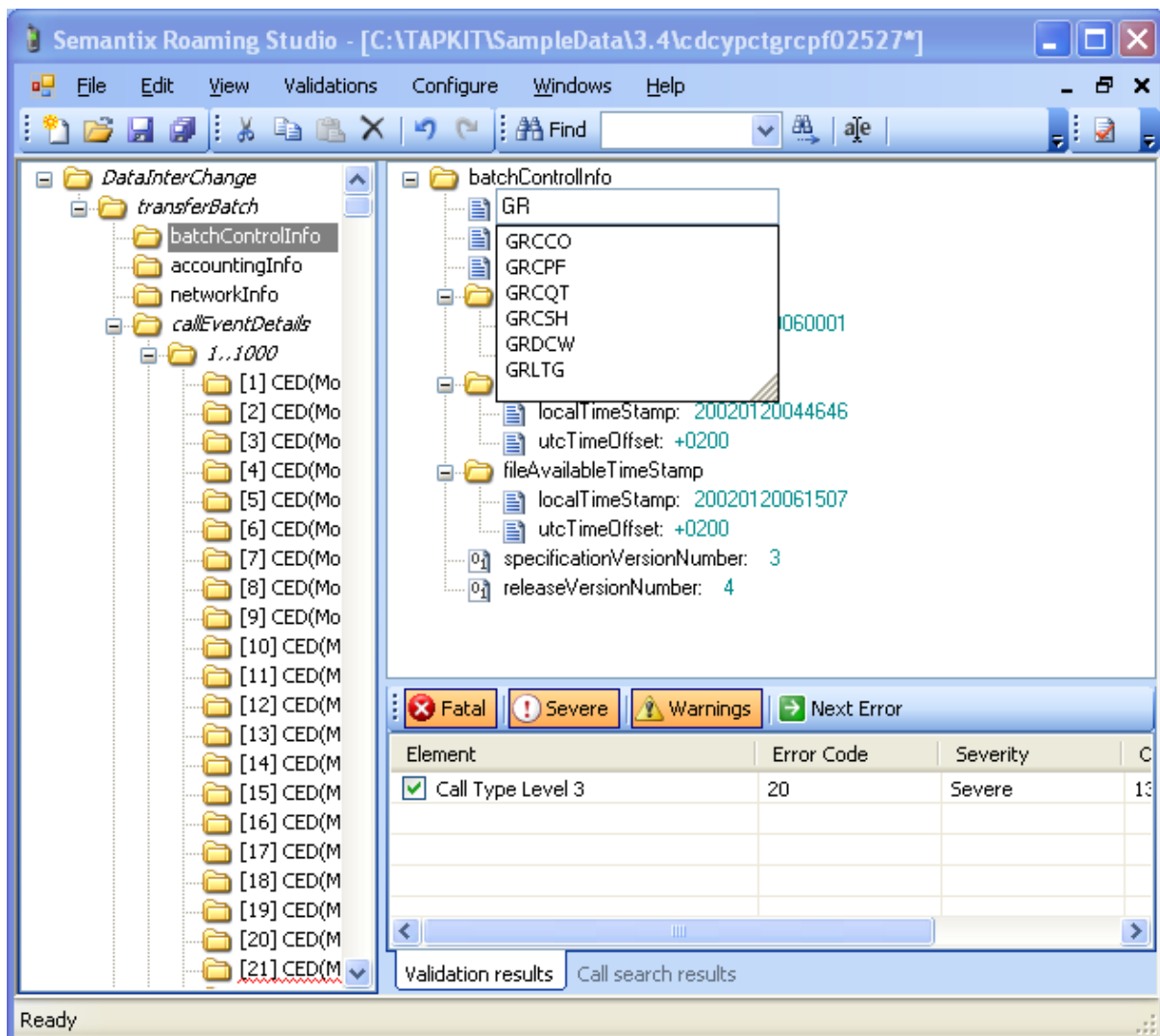
10 Modifying and Creating files

Roaming Studio is a fully featured TAP/RAP/NRTRDE editor. With it you can modify existing TAP/RAP/NRTRDE files in any way you like. You can effect small scale changes as in changing the values of individual fields (e.g. change a “charge” field) or adding or removing individual fields. You can also effect larger scale, structural changes as in deleting or cut-pasting entire calls between files, removing or adding entire substructures (at the call or file level), merging or splitting existing TAP/RAP/NRTRDE files or even creating files from scratch. The purpose of this Chapter is to guide you through the most common of these operations.

10.1 Modifying individual fields

Modifying individual fields takes place in the **Detail view** area of the Roaming Studio application as this is the only place where the ultimate leaf-level fields are depicted. Recall from Chapter The Working Environment that the other file view area, the **File view** area depicts only file level structures that carry no individual fields – just other composite structures.

Modifying the value of an individual field is done in a standard Windows-interface way: just press **F2** or double-click the field and a text box will appear allowing you to enter a new value as depicted in the figure below.



Press F2 or double-click any field to enter its new value

Modifications to the values of individual fields (as well as all editing actions on a file) are undoable up to a practically infinite number of undo levels by pressing **CTRL+Z** or selecting **Edit ▾ Undo**. Conversely, they are also re-doable with **CTRL+Y** or **Edit ▾ Redo**.

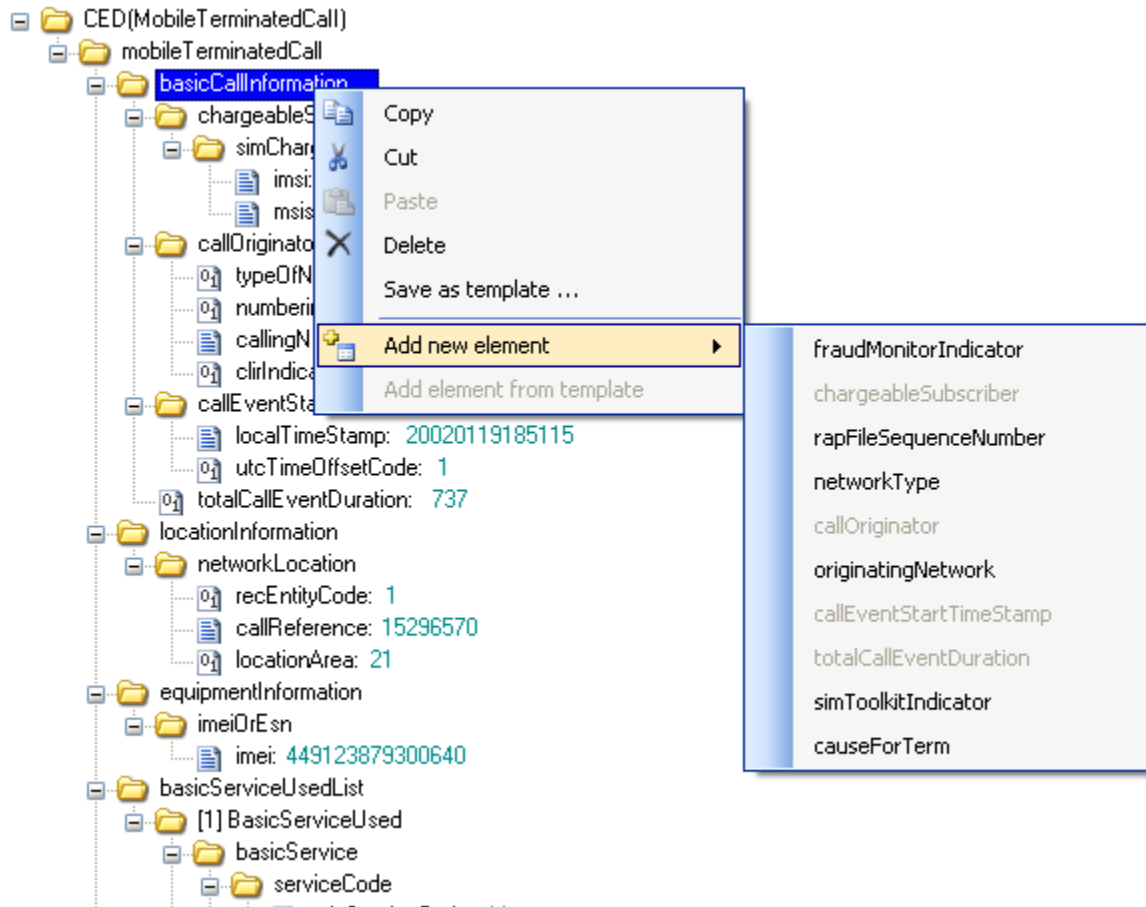
10.2 Adding or removing individual fields

As in modifying individual fields, adding or removing individual fields also takes place in the Detail view area for the same reasons explained in Section Modifying individual fields. Removing a field is performed simply by selecting a field and:

- pressing the **DEL** or **CTRL+X** key (delete or cut respectively)
- clicking the left mouse button and selecting **Cut** or **Delete**
- selecting the **Cut** or **Delete** menu items from the **Edit** menu

In all cases, pressing **CTRL+Z** or selecting **Edit ▾ Undo** will undo the field removal (practically infinite levels of undo are supported). Conversely, unlimited redos are also supported with **CTRL+Y** or by selecting **Edit ▾ Redo**.

Adding an individual field is equally intuitive: all you need to do is select the composite node under which the field should "hung" in the **Detail view** pane, right-click with the mouse and select **addEmptyChild**. Possible fields will appear in the pop up menu. Existing fields (which can of course no longer be added) will be disabled leaving only fields which are currently missing, as depicted in the figure below:



Adding an individual field. Observe that existing fields are disabled.

This way you have a context-aware add functionality which won't allow you to erroneously place a field where it doesn't belong. Naturally, field addition is also undoable with **CTRL+X** or **Edit ⇨ Undo** and redoable with **CTRL+Y** or **Edit ⇨ Redo** up to a practically infinite number of undo / redo levels.

Note that there is also a further way to add an individual field: this involves right-clicking on the parent node and selecting **Add element from template**. This option is usually disabled unless a specific template has been defined for a valid field type hanging under the structure that was right-clicked. This method of adding fields is explained in Section Defining your own composite structure templates.

10.3 Adding or removing composite structures

Adding or removing composite structures is done in much the same way that adding or removing individual fields is done (Section Adding or removing individual fields).

Recall that although individual fields appear only in the **Detail view** pane, composite structures can appear both at the **File view** pane (file-level composite structures) and the **Detail view** pane (call-level composite structures). Therefore although individual fields can be added or removed only in the **Detail view** pane, composite structures and nodes can be added or removed both in the **File view** and the

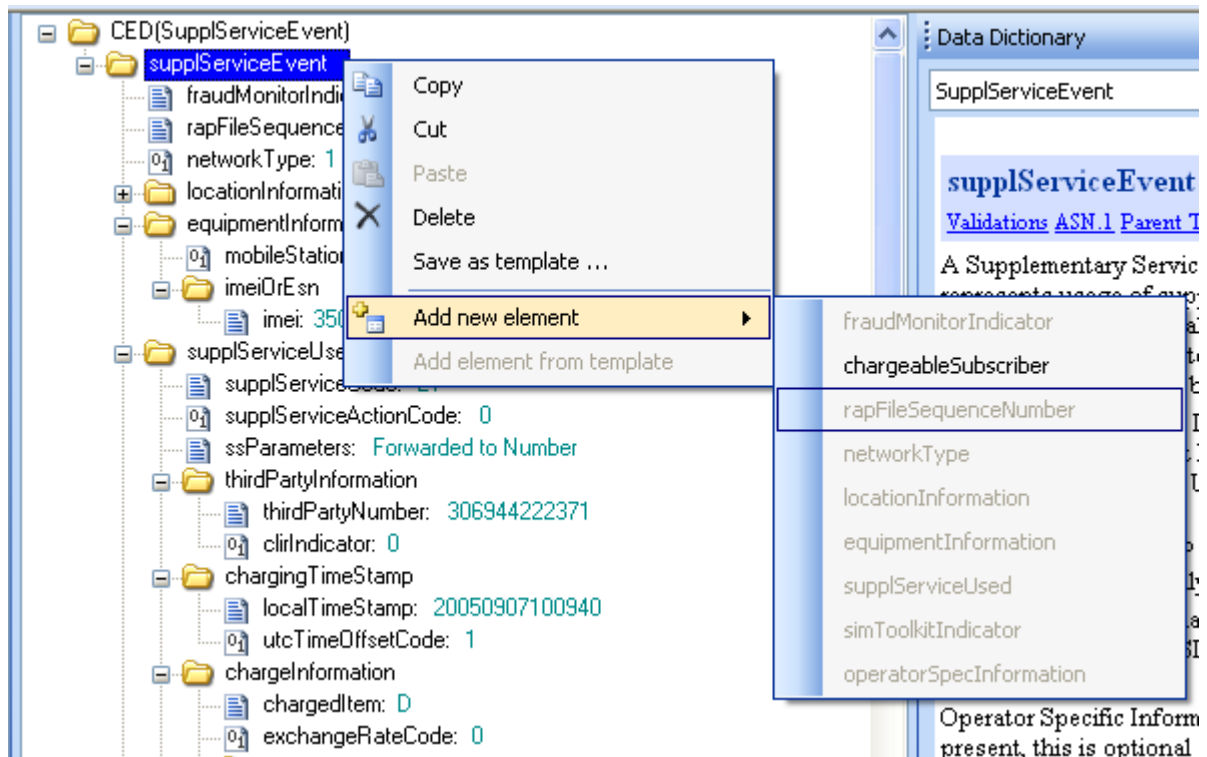
Detail view panes.

To remove a composite structure simply select this structure in the File view pane or Detail view pane as appropriate (depending on where it appears) and either:

- press **DEL** or **CTRL+X** (delete and cut respectively)
- right-click and select **Cut** or **Delete**
- select the **Cut** or **Delete** menu items from the **Edit** menu

In all cases, pressing **CTRL+Z** or selecting **Edit** ➤ **Undo** will undo the composite structure removal (practically infinite levels of undo are supported). Conversely, unlimited redos are also supported with **CTRL+Y** or by selecting **Edit** ➤ **Redo**.

Adding a structure is equally intuitive: all you need to do is select the composite "father" node under which the new structure should "hung" in the Detail view or File view panes, right-click with the mouse and select **Add new element**. Possible structures for the addition will appear in the pop up menu. Existing structures (which can of course no longer be added) will be disabled leaving only structures which are actually currently missing enabled as depicted in the figure below.



Adding a composite structure.

This way you have a context-aware add functionality which won't allow you to erroneously place a structures where it doesn't belong. Naturally, structure addition is also undoable with **CTRL+X** or **Edit** ➤ **Undo** and re-doable with **CTRL+Y** or **Edit** ➤ **Redo** up to a practically infinite number of undo / redo levels.

Note that there is also a further way to add a composite structure: this involves right-clicking on the parent node and selecting **Add element from template**. This option is usually disabled unless a specific template has been defined for a valid structure type hanging under the parent structure that was right-clicked. This method of adding fields is explained in Section Defining your own composite structure

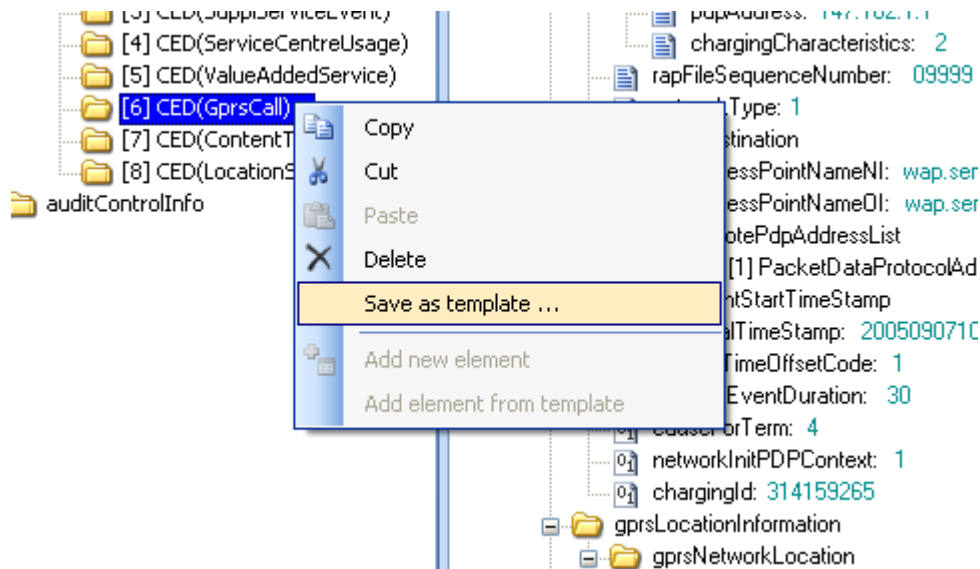
templates.

10.4 Defining your own templates

Semantix Roaming Studio allows you to define your own field or structure templates.

You can define any number of templates for any field or composite structure in a TAP/RAP/NRTRDE file as you chose.

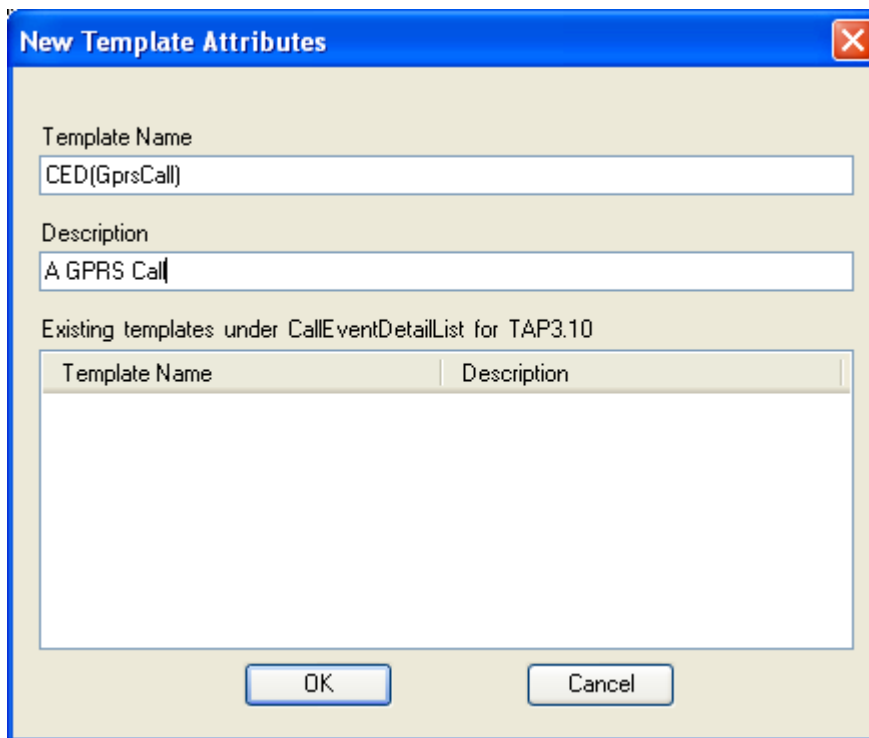
To define a field or structure template simply right-click on a field or structure of an file already open in the editor and select **Save as template...** as depicted in the figure below.



Saving an existing GPRS Call structure as a template.

Note that you can save templates from both the File view and the Detail view panes of the editor.

Selecting the **Save as template...** command from the pop up menu that is displayed when the right mouse button is clicked on an individual field or structure opens the save template dialog which is depicted in the figure below.



The dialog box titled "New Template Attributes" has a blue title bar with a close button. It contains two text input fields: "Template Name" with the value "CED(GprsCall)" and "Description" with the value "A GPRS Call". Below these is a section titled "Existing templates under CallEventDetailList for TAP3.10" which contains a table with two columns: "Template Name" and "Description". The table is currently empty. At the bottom are "OK" and "Cancel" buttons.

Template Name	Description
---------------	-------------

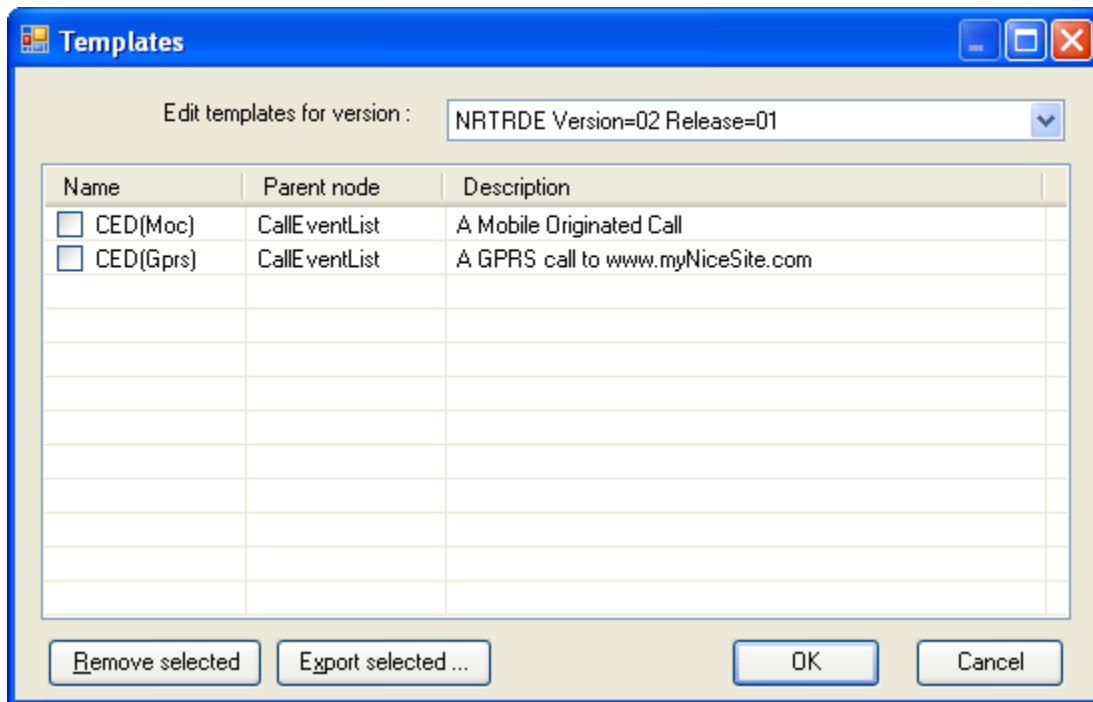
The save template dialog.

The save template dialog allows you to enter a name for your new template (you should choose an intuitive name as you will need to select this name when you get to use the template in the future). It also lists existing templates already defined under the same parent node.

Once a field or structure template is defined you can use it to add new fields or structures of that type. You don't need to worry where it might get added though: the editor will automatically enable the **Add element from template...** command in the popup menu that gets displayed after right-clicking on a field or node whenever a field or node template for an appropriate type is defined. Thus, **Add element from template...** is also context-aware and you cannot accidentally add a template where it can't belong.

Note also that templates are version specific. Therefore any templates saved e.g. from a TAP3.4 file will only be available to add through **Add element from template** in appropriate nodes of TAP3.4 files and in no other TAP releases (and not for NRTRDE/RAP files).

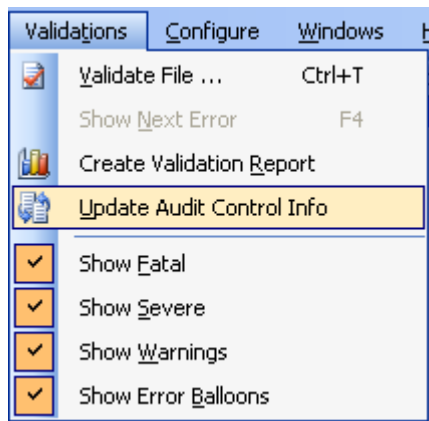
Finally, selecting **Edit Templates...** allows you to view existing templates for every TAP/RAP/NRTRDE version and remove templates you no longer need as depicted in the following figure:



The edit templates dialog.

10.5 Updating AuditControllInfo

Modifying a TAP/NRTRDE file is an inherently unsafe operation that can introduce new warnings, severe errors or even fatal errors in a file unless done by a knowledgeable user. This applies both to small-scale changes like changing the value of an individual field as well as – and more importantly – to structural changes like adding or removing call-level or file-level composite structures or entire calls. A TAP file contains important summary information in the form of the **Audit Control Information** structure. In the case of NRTRDE files, they contain a `CallEventsCount`, which provides the total number of calls. Both kinds of information are used for auditing purposes and are rigorously validated. Most errors on `AuditControllInfo` are rated *fatal* in the TD.57 documentation for all TAP 3 releases - and likewise for NRTRDE's `CallEventsCount`. Since these are in fact aggregates and summaries for all calls present in the files, it is possible that if you change the value of a sensitive field like call charge or call duration, the aggregates computed in this structure will no longer be valid resulting in a fatal file. This is even more so if you don't simply change the value of a field but add or remove entire calls or other important structures. Therefore it is a good idea to request Roaming Studio to automatically recalculate this information, taking into consideration any changes you may have effected on the file. You can do this by selecting the **Update Audit Control Info** menu item from the Validations menu (for NRTRDE, the menu item is named "Update Call Events Count").



Requesting an update for AuditControlInfo

You may wish to consider however that this may also have a side-effect which is beneficial 99% of the time but there could be cases when it is not what you want. Since this structure is re-computed from scratch overwriting existing information it can have the effect of also correcting fatal or severe errors that pre-existed in the TAP/NRTRDE file and preceded any modifications you made or where unrelated to them. This is usually a good thing but there could be cases where you wanted the original severe and fatal errors to persist (e.g. maybe you wanted to report them or ask a vendor to fix something). Therefore you should run and save a validation report before modifying a file just so that you will have an idea where you stand. Better yet, always keep a copy of the original file. Also, run a validation report after you are done modifying the file to make sure you have not inadvertently introduced any new errors in the file.

Chapter



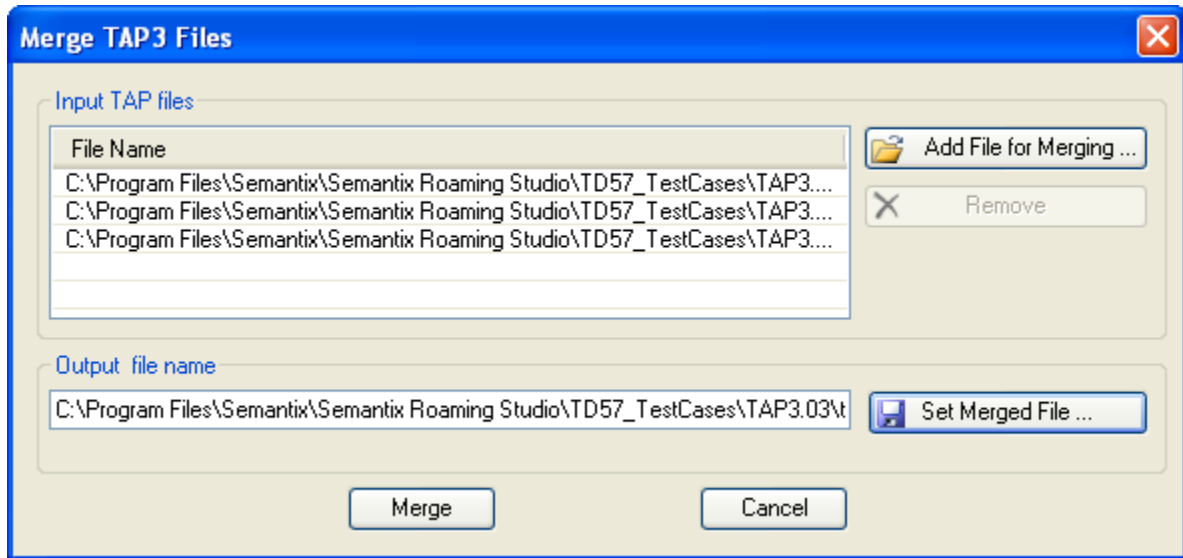
11

11 Advanced Operations

11.1 Merging TAP3 files

Merging of TAP files is a process that takes as input two or more TAP3 files of the same TAP3 release (e.g. 3.10) and produces a single TAP3 file of the same TAP3 release with all their calls.

To merge two or more files simply choose **File**→ **Merge files...** from the menu. The merge files dialog will then appear as depicted in the figure below:

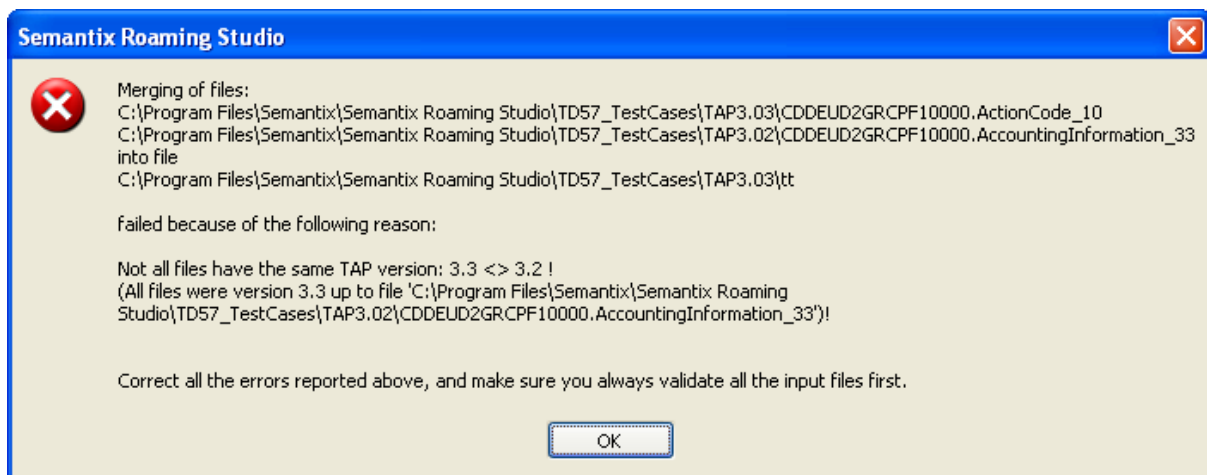


The merge files dialog.

The merge files dialog allows you to add one or more TAP files (pick the TAP files you wish to merge by clicking on the **Add file** button which brings up a standard Windows file chooser dialog) and set the name and location of the merged TAP file to create (the **Set** button which brings up another standard Windows file chooser dialog).

The merge functionality is completely independent of any underlying opened TAP file in Roaming Studio and need not involve it in any way. This is why the **File**→ **Merge files...** menu item is enabled even if no file is presently opened in Roaming Studio.

Note that you can only merge TAP3 files of the same release and that even then, the sender and recipient operators must be the same. The merging operation will complain if these conditions are not met as depicted in the figure below.



You can only merge TAP files of the same version and sender-recipient pair.

The merged TAP file will carry internally the file sequence number of the first TAP file offered for merging (this may not necessarily be the smallest file sequence number) so the name you indicate with the **Set** button must match that number otherwise you will get a fatal validation error. In case where you wish the merged file to carry a file sequence number which is not present in any of the merged files your only option is to accept the file sequence number offered by default and then manually edit the file to change its `FileSequenceNumber` field in the `BatchControllInfo` structure.

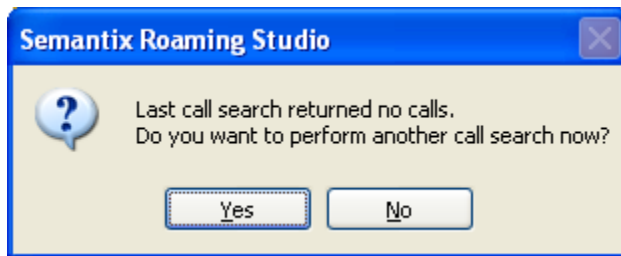
Finally note that there are certain bilaterally agreed limits that place certain constraints on the dates and times of calls present in a TAP file relative to that file's *cutoff timestamp* or *file available* timestamp or the present date and time. This means that there might be situations where merging correct TAP files might yield an erroneous TAP file. However any validation error pronounced in this manner will be on the basis of bilaterally agreed values which may thus be relaxed as an exception, via the **Configure/Validation Rules** menu.

11.2 Splitting files

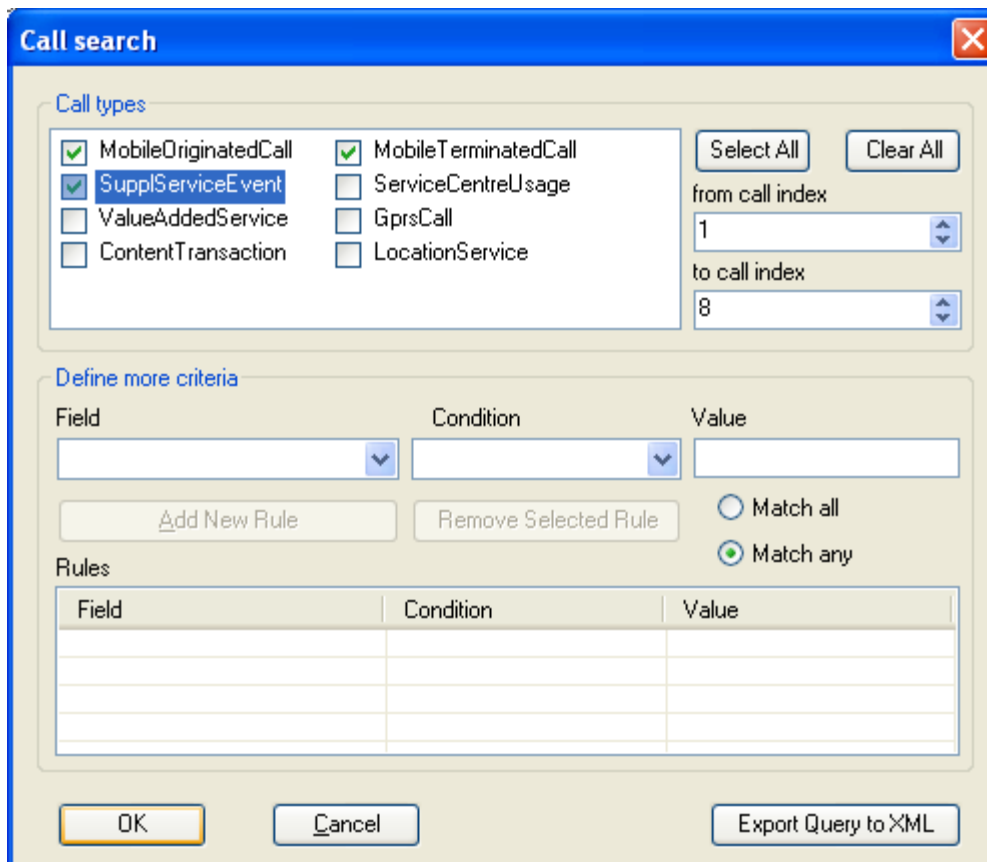
Splitting a TAP/RAP/NRTRDE files refers to the process of distributing the calls that are present in a file into two other files. These files will then collectively contain all the calls found in the original TAP/RAP/NRTRDE file and will have no calls in common between them. In set theory parlance, the set of the two files that are created as a result of the split process constitute a partitioning of the calls found in the original TAP/RAP/NRTRDE file: their union is the original file and their intersection is the empty set.

Splitting a TAP file seen as partitioning operation from a set theory perspective.

Splitting a file in Roaming Studio is fully integrated with the advanced call search facility (see Section Searching files). Therefore, to split a file you must first open a file (this would be the TAP/RAP/NRTRDE file to split) and perform a call search. If you have not performed a call search or if the last call search yielded no calls at all then the split operation will complain that it can not use a set of calls to split with, as depicted in the figure below:

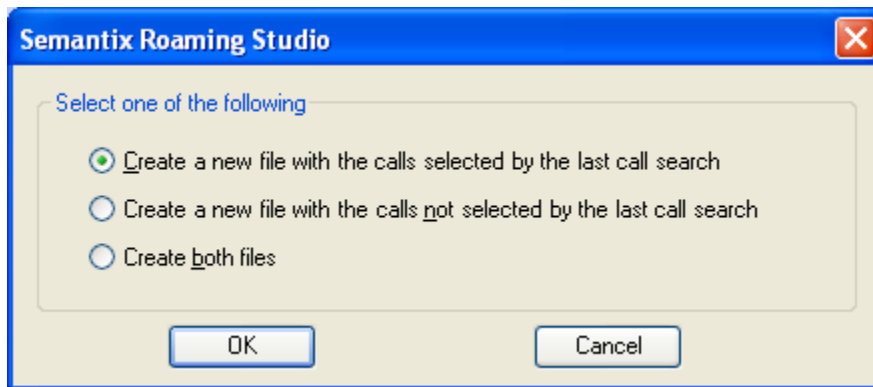


By agreeing, you are offered a change to set the filtering rule, in the same way you would search for these calls:



You must first perform a valid call search before you can split a file.

After performing a call search that yields at least some calls you can select **Split File Using Last Call Search...** from the **Edit** menu. The **Split** dialog depicted in the figure below will then be displayed.



Split dialog.

In the split dialog the user is provided with three options:

- he can create a file including all calls fetched by the last call search
- he can create a file including all calls not fetched by the last call search
- he can create both of the above files effectively splitting the initial file along the call search results

Note that strictly speaking only the third option splits the file. The first two options merely export a subset of the file's calls into another file. Note also that in all three cases the split operation is unobtrusive: the original file is not modified in any way.

Since the splitting operation is by its very design fully integrated with the call search operation the user can use all the elaborate queries that the latter operation enables him to create. Refer to Section Searching files for more information on constructing complex queries.

11.3 Exporting NRTRDE files to ASCII

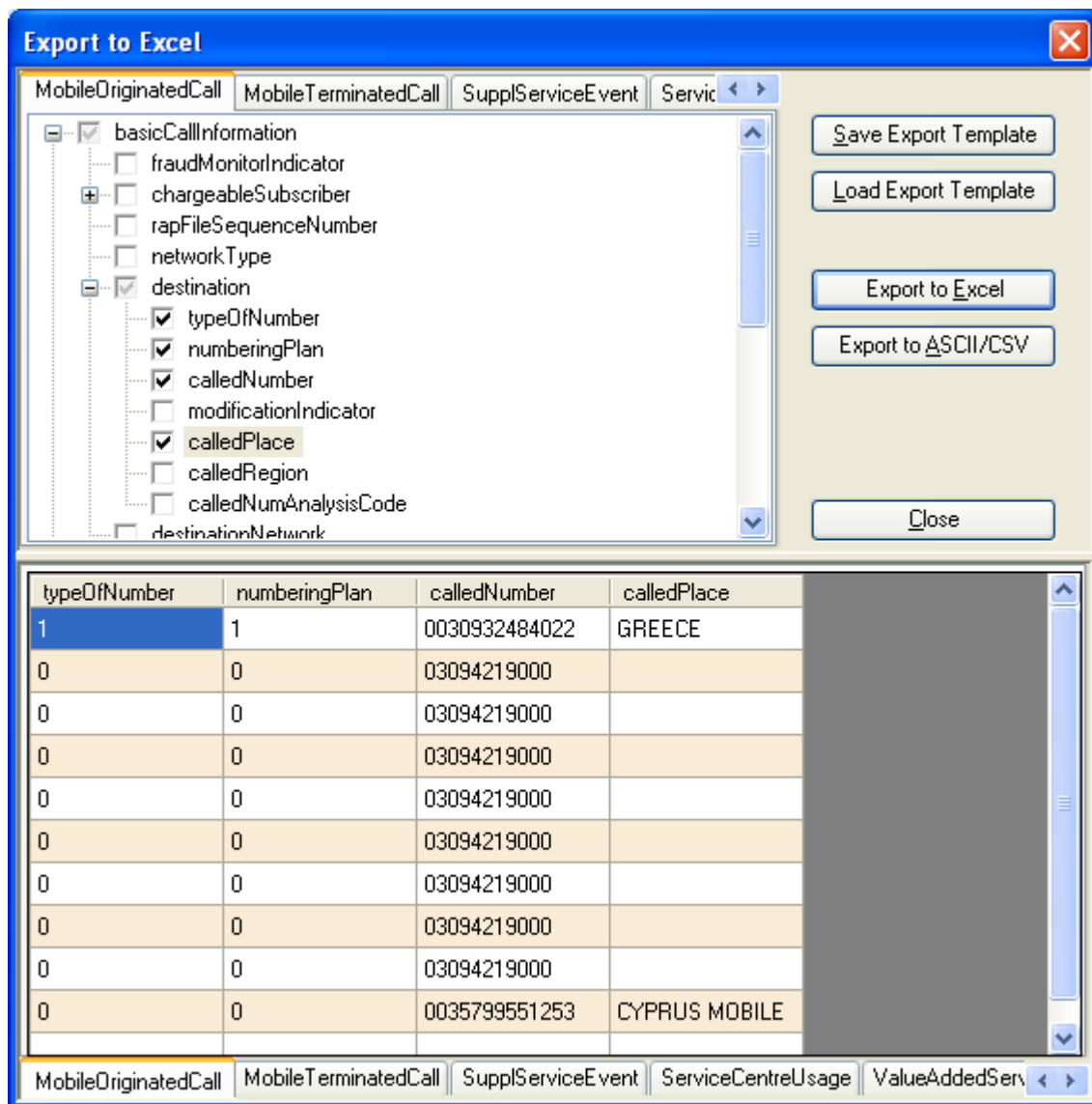
Through the **File/Export To/ASCII NRTRDE..** menu item, a simple ASCII based representation of the currently opened NRTRDE file will be generated. The generated ASCII format includes all the information of the original file:

```
10,2,1,"GRCPF","DEUD2","0000001","20080205140000","+0200",140
20,"262027352084232","444788070366510","20080205122105","+0100",1564,0,"11",,,,"00436643313540","4366433135
30,"262027352084232","444788070366510","20080205122053","+0200",0,0,"21",,,,"436643313540","ST. POELTEN",2,
40,"262022464569171","49010041059856","20080205124306","+0200",3269,0,"WEB_CONNECT","WEB_CONNECT",13037646,
20,"262027352084232","444788070366510","20080205125015","+0100",1803,0,,,"23",,,,"00436643313540","4366433135
...
```

See also the NRTRDE2ASCII Roaming Component on <http://www.tapeditor.com>

11.4 Exporting files to Excel/CSV

Roaming studio users might want to extract the information of a TAP / RAP or NRTRDE file into an easy to process format. For example, the fraud detection department might expect reports, or graphs on call charges. The **File/Export To/Excel** menu item offers this functionality:



Exporting data to Excel

The dialog that pops up allows the user to specify what information he wishes to extract from the file. The top half of the dialog contains a set of tabs, one for each call category (in the screenshot above, MobileOriginatedCall, MobileTerminatedCall, etc). In this top half, the user can specify which fields he wants to get in the generated Excel file, by just clicking on the desired fields. As soon as he clicks on them, the bottom half fills with information from the currently opened file - a quick preview of what kind of data will come through.

The set of selected fields can be saved (for future re-use) using the **Save Export Template** button, or loaded using the **Load Export Template** button.

By pressing the **Export to Excel** button, the user can then generate the desired output file, and open it in Excel:

	A	B	C	D	E
	typeOfNumber	numberingPlan	calledNumber	calledPlace	
1	1	1	0030932484022	GREECE	
2	0	0	0035799551253	CYPRUS MOBILE	
3	0	0	0035799551253	CYPRUS MOBILE	
4	1	1	0030932484022	GREECE	
5	1	1	0030932484022	GREECE	
6	0	0	03094219000		
7	0	0	03094219000		
8	0	0	003579638335	CYPRUS MOBILE	
9	0	0	05393227	CYPRUS LEMESOS	
10	0	0	0035724530560	CYPRUS LARNACA	
11	0	0	0035724530560	CYPRUS LARNACA	
12	0	0	03094219000		
13	0	0	03094219000		
14	0	0	03094219000		
15	1	1	0030944400111	GREECE	
16	0	0	192	CYPRUS	
17	0	0	03094219000		
18	0	0	0035726938697	CYPRUS PAFOS	
19	0	0	03094219000		
20	0	0	003572671655	CYPRUS LEFKOSIA	
21	0	0	003572671655	CYPRUS LEFKOSIA	

Screenshot from exported file opened in Excel

The user can also click on the **Export to ASCII/CSV** button: in that case, the data are exported in a simple ASCII format:

```

typeOfNumber;numberingPlan;calledNumber;calledPlace
1;1;0030932484022;GREECE
0;0;0035799551253;CYPRUS MOBILE
0;0;0035799551253;CYPRUS MOBILE
1;1;0030932484022;GREECE
1;1;0030932484022;GREECE
0;0;03094219000;
0;0;03094219000;
0;0;003579638335;CYPRUS MOBILE
0;0;05393227;CYPRUS LEMESOS
0;0;0035724530560;CYPRUS LARNACA
0;0;0035724530560;CYPRUS LARNACA
0;0;03094219000;
0;0;03094219000;
0;0;03094219000;
0;0;03094219000;

```

11.5 Importing / Exporting files from / to XML

Roaming Studio enables users to import / export TAP, RAP and NRTRDE files from / to XML. Note that Roaming Studio can only import XML files created with the "exporting to XML" facility of the Roaming Studio itself. That is, it can import only its own XML format and not any other formats. Roaming Studio uses its own XML schema known as the Roaming Studio XML Schema Definition. This XML schema is also supported by the Roaming Components TAP2XML, XML2TAP and

NRTRDE2XML:

```
<?xml version="1.0" encoding="utf-8" ?>
<TAP3File mjVersion="3" mnVersion="11" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <DataInterChange>
    <transferBatch>
      <batchControlInfo>
        <sender>DEUD2</sender>
        <recipient>GRCPF</recipient>
        <fileSequenceNumber>10000</fileSequenceNumber>
        <fileCreationTimeStamp>
          <localTimeStamp>20050907120940</localTimeStamp>
          <utcTimeOffset>+0300</utcTimeOffset>
        </fileCreationTimeStamp>
        <transferCutOffTimeStamp>
          <localTimeStamp>20050907120940</localTimeStamp>
          <utcTimeOffset>+0300</utcTimeOffset>
        </transferCutOffTimeStamp>
        <fileAvailableTimeStamp>
          <localTimeStamp>20050907120940</localTimeStamp>
          <utcTimeOffset>+0300</utcTimeOffset>
        </fileAvailableTimeStamp>
        <specificationVersionNumber>3</specificationVersionNumber>
        <releaseVersionNumber>11</releaseVersionNumber>
        <rapFileSequenceNumber>09999</rapFileSequenceNumber>
        <operatorSpecInformation>
          <OperatorSpecInformation>Test case generated with Semantix Toolkit</OperatorSpecInformation>
        </operatorSpecInformation>
      </batchControlInfo>
      <accountingInfo>
        <taxation>
          <Taxation>
            ...
          </Taxation>
        </taxation>
      </accountingInfo>
    </transferBatch>
  </DataInterChange>
</TAP3File>
```

An example of exporting a TAP file to XML

This schema is designed specifically for exporting files from the Roaming Studio for external processing and re-importing them, and it is the only XML schema with which this is possible. The Roaming Studio XML Schema Definition is derived from a simple association with the related TAP / RAP / NRTRDE grammar: all variables in the ASN.1 grammar constitute their own XML nodes, and all SEQUENCE_OF nodes enumerate their contents through nodes named after the contained element type. This way it is easy for users to develop scripts or applications to either externally process the Roaming Studio XML Schema or to modify the exported files automatically using a script or external program and then re-import them as TAP / RAP / NRTRDE files with the modifications they have incurred.

This is also the basic rationale behind the provision of this facility. Exporting files into a proprietary XML format or importing XML files following the selfsame format makes sense mostly for one reason: to allow the user to:

1. externally process TAP / RAP / NRTRDE files in an equivalent lossless representation as XML files using external, third party text processing or XML processing tools
2. re-import the externally processed files in the TAP / RAP / NRTRDE format, internalizing the externally-incurred changes

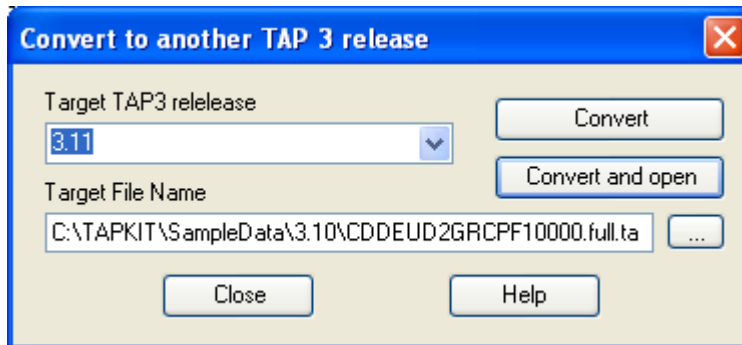
Less important, but still likely reasons would be to allow the XML representation to be viewed, edited or manipulated by external XML-based tools and applications for purposes other than its re-importation (e.g. reports).

11.6 Converting TAP files to other TAP versions

The Roaming Studio TAP editor can automatically convert existing TAP3 files to other TAP3 releases both upwards (e.g. convert from TAP3.9 to TAP3.11) and downwards (e.g. convert from TAP3.4 to

TAP3.1).

Simply choose: **File**→**Export to**→**Another TAP3** release from the **File** menu. The TAP Conversion dialog depicted in the figure below is then displayed.



Using this dialog the user is able to select the target TAP3 release, the target converted file's name and location and either convert the file silently (i.e. without opening the converted file in the TAP editor) or convert the TAP file and immediately open the converted version in Roaming Studio.

Note that in all cases, the conversion process is unobtrusive, i.e. read-only as regards the original TAP file to be converted which is not modified in any way.

Also note that conversion is a "best effort" process. What this means is that it is not always possible to produce a 100% semantically equivalent representation of a TAP3 file in a different TAP version especially as "semantically equivalent" may mean different things to different users and business cases. The process has been implemented with the following, common sense, practical guides in mind:

- sustain and preserve the essential file and call characteristics (e.g. charge, duration, A- and B-numbers)
- when the original TAP file is valid, to any extent possible attempt to produce a converted TAP file that does not contain any fatal or severe errors
- implement mappings of concepts or value lists when doing so is meaningful and reasonably correct under all circumstances but refrain from any other mapping or mediation between formats that may or may not be acceptable depending on the peculiar user requirements

Finally note that the conversion process behaves best when the original TAP file is valid. When the original TAP file is not valid and contains fatal or severe errors the possibility increases that something in the conversion process will go amiss. This is not to say that it is not possible to convert flawed TAP files. The conversion process will simply issue a warning to that effect but will otherwise proceed and perform a "best effort" conversion.

With this in mind the following methodology is proposed for converting TAP files:

1. validate the original TAP file
2. if there are any fatal or severe errors in the file it is advisable but not obligatory that you first attempt to eradicate them by editing the file before proceeding with the conversion
3. validate the edited file again and take note of the fatal and severe errors in the file version which was submitted for conversion. this will allow you to track whether the conversion process (in itself) introduced any severe or fatal errors
4. convert the TAP file to the required target release and validate the converted file
5. if there are any fatal or severe errors which were not present in the original TAP file fix them

manually using the Roaming Studio and/or report this issue to Semantix through our Mantis database (<http://www.tapeditor.com/mantis/>).

Finally note that Semantix also offers (as a service) customized conversion profiles for customers with unique requirements (e.g. convert GPRS calls into MOC calls with the same charging characteristics).

11.7 Anonymizing files

Anonymizing TAP/RAP/NRTRDE files refers to the process of removing sensitive information from a file. The most obvious reason for doing something like that would be to yield a file which you could freely share with your co-workers for testing or other purposes. It might also be useful when you want to point an error in a file in a vendor so you need to send him the file but you want to strip it of any personal or sensitive information. In general, whenever you need to share your files across your department or your organization's boundaries. The anonymization process explicitly tries to preserve existing severe or fatal errors as removing them would render it inappropriate for the purpose of communicating errors or for testing purposes. In other words, the anonymization process statically overwrites:

- Imsi
- Msisdn
- Imei
- AddressStringDigits
- DialedDigits
- CamelServerAddress
- CalledNumber
- CallingNumber
- CamelDestinationNumber
- ThirdPartyNumber

To anonymize a file simply chose **File→ Export to→ Anonymized file...** from the **File** menu. A standard file dialog is then displayed allowing you to indicate the name and location of the anonymized file. Like all other conversion / export operations that are accessible through the **File→ Export to** menu, the anonymization process is completely unobtrusive to the original file.

11.8 Configuring Reference Data

There are four categories of reference data that you might want to configure in the Roaming Studio environment:

- Countries
- Currencies
- PMN Reference
- Validation rules

These are all accessible through the **Configure** menu and are each explained in the sections that

follow.

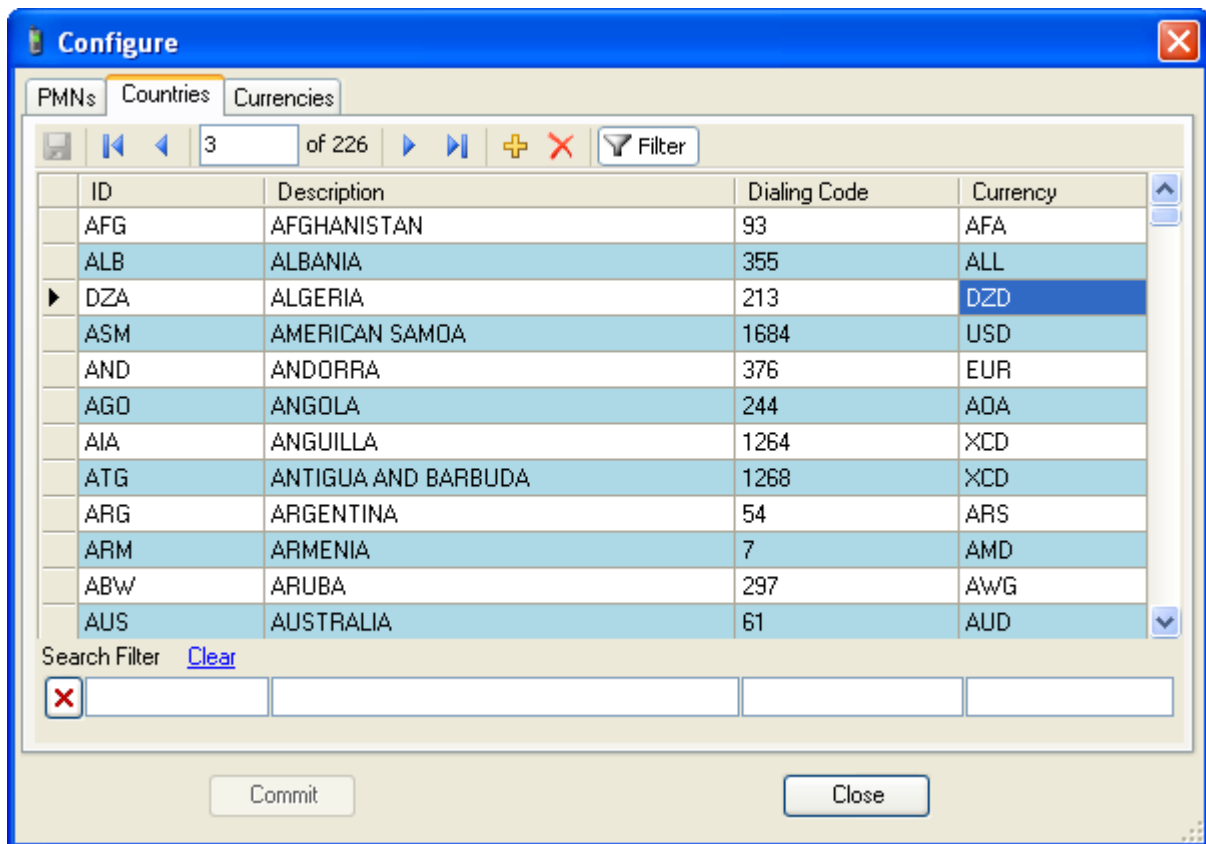
Menu item **Validation Rules..** of the **Configure** menu allows the user to modify the default validation logic by either changing the severity of certain validations (e.g. from severe to fatal or to warning) or changing the default ranges and value lists these validations check for. This functionality is described in Overriding Default Validation Logic.

11.8.1 Configuring Countries

Country configuration refers to configuring dialling codes and currencies for countries.

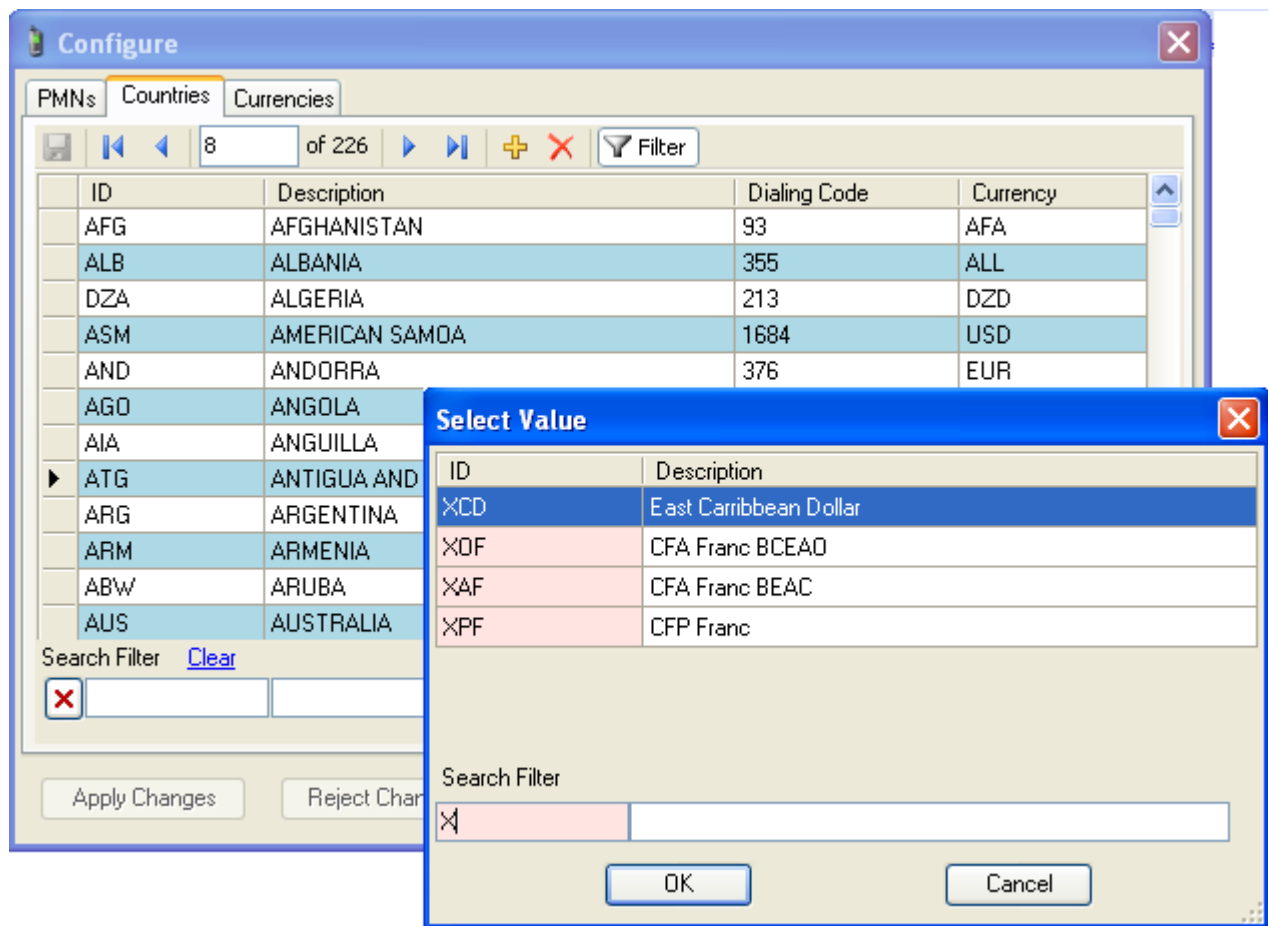
The facility is accessed by selecting **Configure**→ **Countries...** through the **Configure** menu.

The **Countries** tab at the **Configuration** dialog is then displayed as depicted in the figure below.



The dialog allows the user to examine and edit three properties for each country:

- the country's long name (description). This field is simply for identification purposes and does not enter into any computation or validation
- the country's dialling code
- the country's currency. This is a three letter code uniquely identifying the currency used in that country. Values in that field must also be present in the **Currencies** tab (described in Configuring Currencies). An attempt by a user to indicate a currency code that fails to cross-reference with the list of currencies set up in the **Currencies** tab of the **Configuration** dialog will result in a complaint by the Roaming Studio to the effect that it can not identify the currency code indicated. To assist in this, if you double click on the Currency field a lookup table will popup, allowing you to specify search prefixes for the currency you seek, and eventually, double click on it:



Selecting a currency

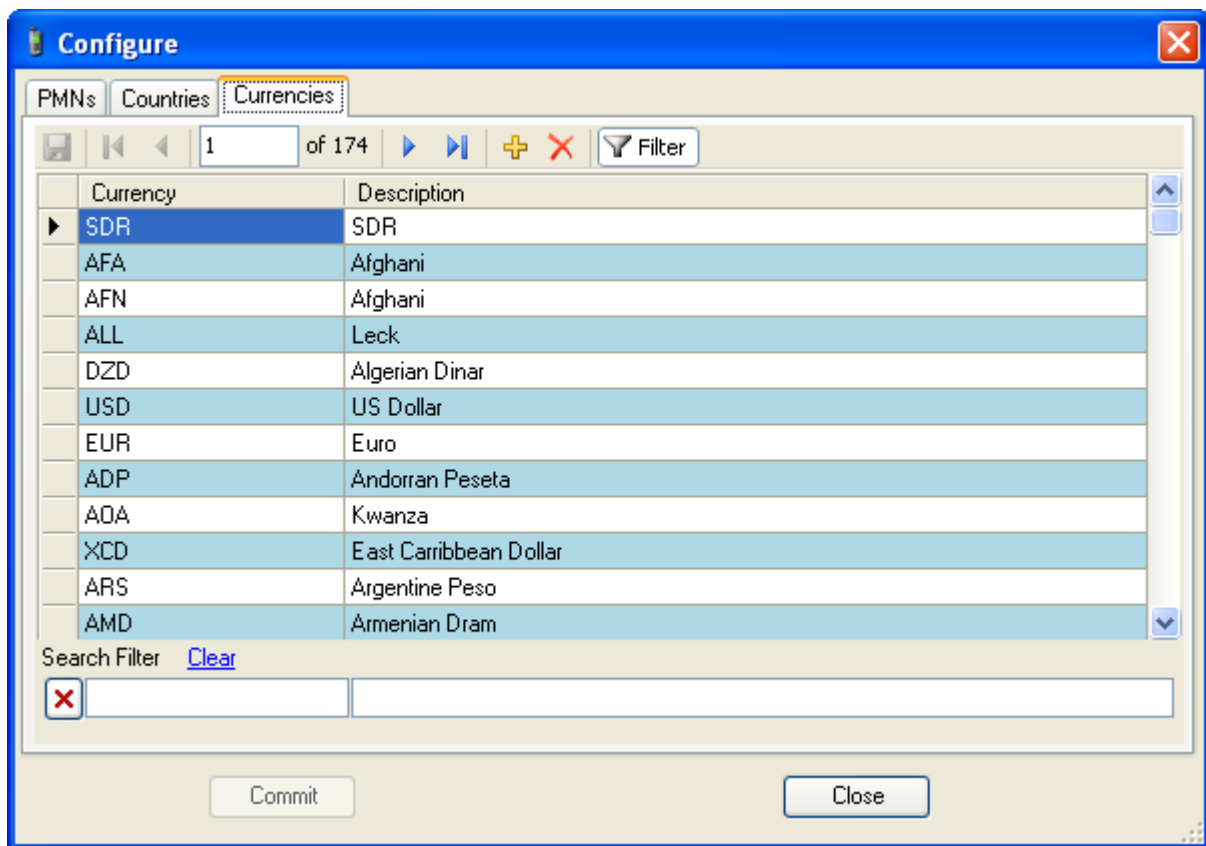
The country's three letter abbreviated form (country id in the first column) may not be modified as it is the "primary key" of that table. Rows may be added or deleted to that table though.

As the table has been initialized according to international standards and reference lists identifying country short names, dialling codes and currencies it is advised that only knowledgeable users should modify these data.

11.8.2 Configuring Currencies

Currencies are configured by selecting **Configure→ Currencies...** from the **Configure** menu.

This brings up the dialog displayed in the figure below.

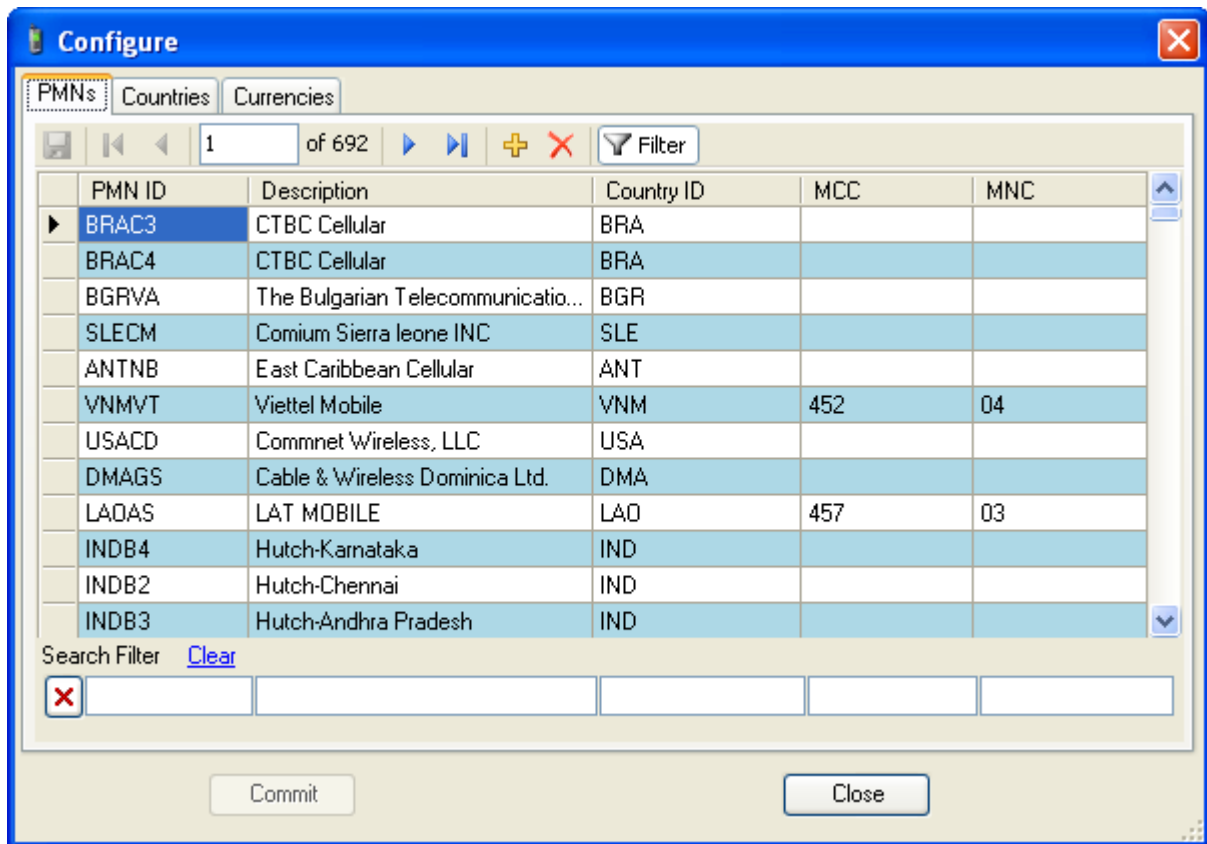


Actually, since the **Currency** field is the primary key to the table and thus unmodifiable the only thing that a user may change is the description of the currency. The description however is used only for identification purposes and does not enter into any calculation or validation logic. Therefore the basic mechanism to configure currencies is with the addition of new row when appropriate or the removal of existing row when new currency units become obsolete.

Since the currency list has been initialized with valid values taken from reference international standards only knowledgeable users should modify these data.

11.8.3 Configuring Other Networks

Other public mobile networks are configured through the **PMNs** tab of the **Configure** dialog depicted in the figure below:



This dialog is accessible by selecting **Configure→ PMN Reference...** from the **Configure** menu.

- The **PMN ID** column is the 5-letter mobile operator code and is a read only column and the primary key to the networks table.
- The **Description** column is used simply for identification purposes and does not enter into any calculation or validation logic.
- The **Country ID** column contains the country ID, as seen in the Countries dialog (see Configuring Countries)
- The **MCC** column is the country-specific IMSI prefix for that operator
- The **MNC** column is the operator-specific IMSI prefix for that operator

Like all other reference configuration dialogs you are able to add or remove entries. The usual caveat is also issued to the effect that the table has been initialized with reference data obtained from authoritative lists so only knowledgeable users should modify these data.

11.9 Overriding Default Validation Logic

Validation logic is defined in the TD57 standards. Each validation rule (when not obeyed) results in one of three error categories:

- Warning (not an important error)
- Severe (error invalidates the whole call)
- Fatal (error invalidates the whole file)

The first pane in the Validation Rules dialog allows the user to change the reported error level for a

specific validation, through the "Severity" column.

The user can additionally disable a specific validation rule altogether, by toggling the "Enabled" checkbox:

Configure Validation Rules

TAP Version: TAP3.11 Active Date: Sunday, January 01, 2006 12

Validations Sets Bilateral Agreements

Element	Error Code	Context	Enabled	Severity
Access Point Name NI	10	GPRS	<input checked="" type="checkbox"/>	Severe
Access Point Name OI	10	GPRS	<input checked="" type="checkbox"/>	Severe
Accounting Information	30	TfBatch	<input checked="" type="checkbox"/>	Fatal
Accounting Information	31	TfBatch	<input checked="" type="checkbox"/>	Fatal
Accounting Information	32	TfBatch	<input checked="" type="checkbox"/>	Fatal
Accounting Information	33	TfBatch	<input checked="" type="checkbox"/>	Fatal
Accounting Information	34	TfBatch	<input checked="" type="checkbox"/>	Fatal
Accounting Information	35	TfBatch	<input checked="" type="checkbox"/>	Fatal
Action Code	10	SS	<input checked="" type="checkbox"/>	Severe
Action Code	20	SS	<input checked="" type="checkbox"/>	Severe
Action Code	22	SS	<input checked="" type="checkbox"/>	Severe
Actual Delivery Timestamp	10	Content	<input checked="" type="checkbox"/>	Severe
Actual Delivery Timestamp	100	Content	<input checked="" type="checkbox"/>	Severe

Search Filter [Clear](#)

Commit Close Duplicate

In many cases, validation is simply checking for existence of one of a set of allowed values. These sets are also modifiable through the "Sets" pane, by first selecting the desired set and then changing its values in the "Selected set elements" grid. To ease the selection of a set, the pane also shows which validation rules reference the particular set (in the bottom right grid).

Configure Validation Rules

TAP Version: TAP3.11 Active Date: Sunday, January 01, 2006 12

Validations Sets **Bilateral Agreements**

Set	Description	Type
SupplServiceActionCodeSSSet		int
SupplServiceActionCodeUSSDSet		int
AdvisedChargeSet		int
AgeOfLocationSet		int
BearerServiceCodeSet		string
CallEventDetailsCountSet		int

Search Filter [Clear](#)

Selected set elements

DESCRIPTION	VALUE
Registration	0
Erasure	1
Activation	2
Deactivation	3
Interrogation	4

Validation rules using the selected set

ELEMENT	ERROR CODE
Action Code	20

Commit Close Duplicate

Finally, some validation rules are toggled on or off based on a bilateral agreement between the two operators (the sending and the receiving one). These can be adjusted from the "Bilateral Agreements" pane:

Configure Validation Rules

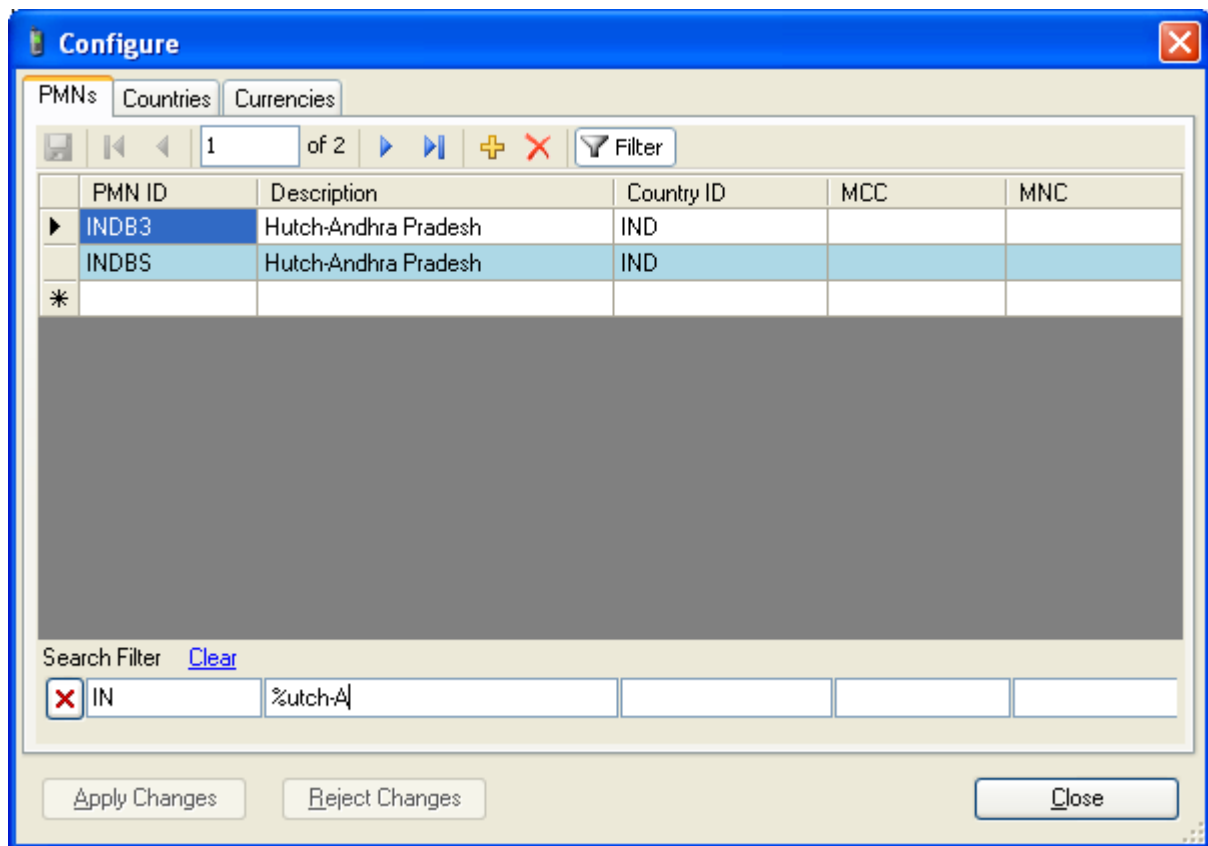
TAP Version: TAP3.11 Active Date: Sunday, January 01, 2006 12

Validations Sets **Bilateral Agreements**

ID	Description	Enabled
bUseOfContentTransactionAgreed		<input checked="" type="checkbox"/>
bUseOfServiceCentreUsageAgreed		<input checked="" type="checkbox"/>
bUseOfValueAddedServiceAgreed		<input checked="" type="checkbox"/>
bUseOfGprsCallAgreed		<input checked="" type="checkbox"/>
bUseOfLocationServiceAgreed		<input checked="" type="checkbox"/>
bChargeType00IsEqualToTheSumOfOthers		<input type="checkbox"/>
bBreakupOfChargeTypes0103IsExpected		<input type="checkbox"/>
bMisdnExpected		<input type="checkbox"/>
bInterNetworkAccountingChargeUseAgreed		<input type="checkbox"/>
bServingBidExpected		<input checked="" type="checkbox"/>
bServingLocationDescriptionExpected		<input checked="" type="checkbox"/>
bUseOfOperatorSpecInfoListAgreed		<input checked="" type="checkbox"/>
bTaxationExpected		<input type="checkbox"/>
bCamelCallExpected		<input checked="" type="checkbox"/>
bDiscountingExpected		<input type="checkbox"/>
bPreviouslyReceivedAndRejectedWithFatal...		<input checked="" type="checkbox"/>

Commit Close Duplicate

In all the grids where a lot of entries are shown, a "Search Filter" is also shown below them. This allows the user to quickly see the entries he is interested in, by writing a "search phrase":



. This can be simply a prefix (in the screenshot above, "IN" in the first column selects those PMNs that start with "IN") or a simple search expression using operator '%', which translates to mean "anything". The second search column above contains "%utch-A", thus selecting all the records that contain in their second column a string that contains "utch-A" somewhere inside them.

Chapter



12

12 Troubleshooting

When encountering any problem or issue which this user manual fails to anticipate please visit the F.A.Q. at <http://www.tapeditor.com/faq/> and/or email us with your question at support@tapeditor.com. If you consider the behavior a bug, please take the time to register and report this bug in our bug-tracking database at <http://www.tapeditor.com/mantis/>. We respond to all email inquiries within 24 hours and most of the time, much earlier. If applicable, your EULA may also identify certain phone-support numbers which you can call to get your questions answered immediately by one of our experts.

We very much welcome bug reports, feature wish-lists and any other comment on the product, this manual (contents or organization) or our service. We view all such bug reports / comments / complaints (especially complaints) as essential in improving our product line and services and we will go out of our way to reciprocate the courtesy of any such communication.

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