Chapter

5

Tutorial: TTCN Suite Basics (on UNIX)

This tutorial is intended as an easy introduction to the TTCN suite for the newcomer. It is also assumed that you have some basic knowledge about UNIX. In addition, to find the TTCN suite meaningful to use, you have to understand TTCN.

Note: UNIX version

This is the UNIX version of the tutorial. The Windows version can be found in chapter 4, *Tutorial: TTCN Suite Basics (in Windows)*.

Note:

This document is a TTCN suite primer and is not intended to provide a tutorial on TTCN. The volume TTCN Suite Methodology Guidelines introduces some basic TTCN features presented with the aid of a simple example.

Purpose of This Tutorial

The purpose of this tutorial is to make you familiar with the basic functions of the TTCN suite. The sections in this chapter are to be read sequentially. You will start by setting up the TTCN suite environment. Then you will create a TTCN test suite, edit the tables in the test suite and apply some basic the TTCN suite tools.

It is assumed that you know how to use UNIX but that you have no or little previous knowledge about the TTCN suite. However, to understand the full use of the TTCN suite, you should have knowledge of TTCN. The volume TTCN Suite Methodology Guidelines introduces some essential TTCN features, presented with the aid of a simple example.

Setting Up the TTCN Suite Environment

It is assumed that the TTCN suite (or Telelogic Tau) has been installed correctly, according to the instructions in the *Installation Guide*. The Telelogic Tau installation directory is pointed out by the environment variable `$telelogic`. This variable has to be set correctly in your UNIX environment.

1. The TTCN suite commands are made available if you add the Telelogic Tau `bin` directory to the environment variable `PATH`:

   ```
   setenv PATH ${PATH}:$telelogic/bin
   ```

2. Also set the environment variable `MANPATH` to include the TTCN suite and the X11 man directories, to make the manual pages available:

   ```
   setenv MANPATH \
   ${MANPATH}:$telelogic/itex/man:$telelogic/X11/man
   ```

If you type **`man itex`**, the UNIX manual entry for the TTCN suite will be displayed. It describes the switches that may be used to set the default settings of the dialog options.

To be able to use the on-line help, you need an HTML viewer, either Netscape or Internet Explorer. To select the HTML viewer to use, see "Customizing the On-Line Help" on page 290 in chapter 4, *Managing Preferences, in the User's Manual*.

Starting the TTCN Suite

Once the TTCN suite software has been installed, you can start it from a UNIX shell tool (e.g. an X-term) by the command `itex`:

- Type **`itex`** to start the TTCN suite.

After a few seconds, the *Organizer* window is displayed. The Organizer is the main window from which you have access to the tools in the Telelogic Tau environment.

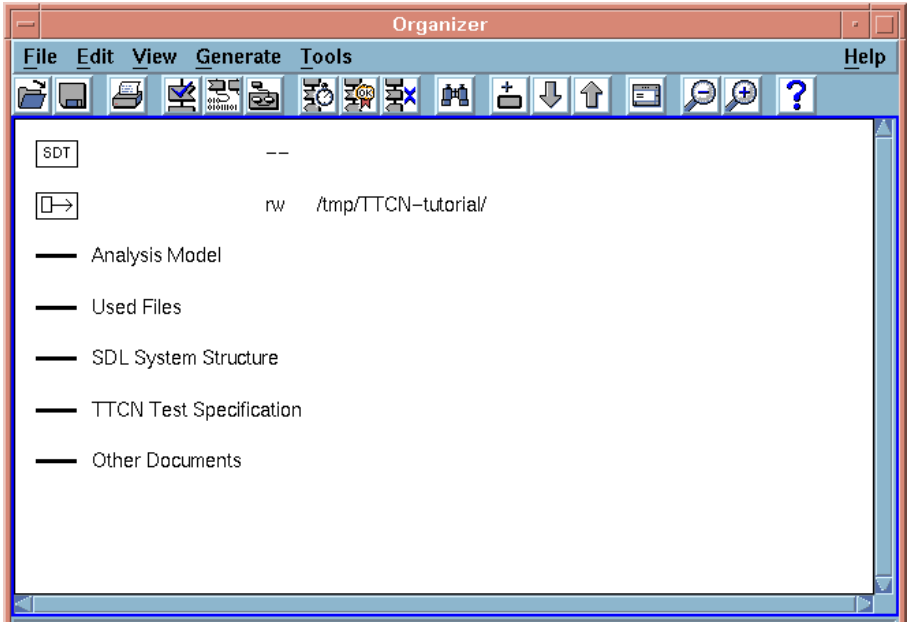


Figure 29: The Organizer main window

A welcome window, where you may read the licensing agreement for Telelogic Tau, will also be displayed. The window disappears as soon as you click the *Continue* button or perform any action in the Organizer.

The Organizer consists of a main window and a log window. In the main window, five areas – known as *chapters* – are displayed by default:

- *Analysis Model*
- *Used Files*

- *SDL System Structure*
- *TTCN Test Specifications*
- *Other Documents*

You may freely use these chapters to hold a number of documents and chapters may also be renamed, deleted and created – the actual use is a matter of personal taste.

More information about customizing the chapters can be found in "Customizing the Organizer Chapters" on page 51 in chapter 3, *Tutorial: The Editors and the Analyzer*, *in the SDL Suite Getting Started*.

Creating a TTCN Test Suite Document

What You Will Learn

- To set the source and target directory
- To create a new test suite

Setting the Source and Target Directory

You will begin by setting the source and target directory in the Organizer. The source directory is where your new documents will be saved by default. The target directory is where generated files are put. Both of these directories must already exist – they cannot be created in the Organizer.

1. Double-click the source directory icon in the Organizer window.

   – You may also select the source directory icon and then select *Edit* from the *Edit* menu in the Organizer or select *Set Directories* from the *File* menu.

   The *Set Directories* dialog is opened, and you may change the source and target directories.

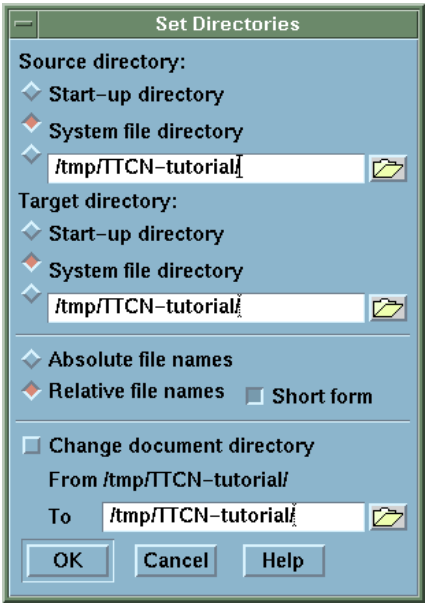


Figure 30: The Set Directories dialog

2. Select the source directory by writing the path in the text field or by browsing in the dialog that is opened when you click the folder button. Make sure that you have write access to the directory.
3. In the same way, you can change the target directory.
4. Click *OK* in the *Set Directories* dialog.

Creating a New Test Suite

When you have set the source and target directories, you should create a new TTCN document of type *test suite* or *modular test suite*:

1. Select the chapter *TTCN Test Specification* in the Organizer.
2. Select *Add New* from the *Edit* menu in the Organizer.

   The *Add New* dialog is opened. In the dialog you should set the document type and name.

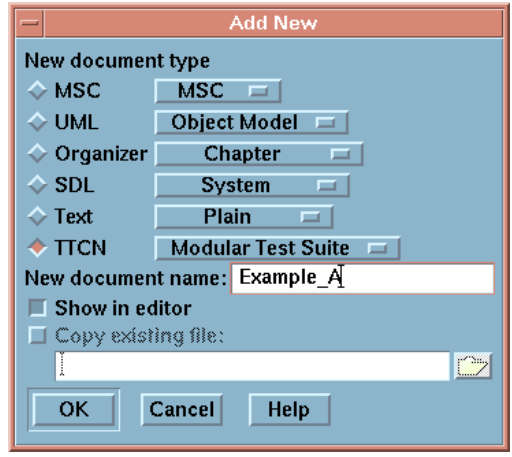


Figure 31: Add New dialog

3. Select *TTCN* and *Test Suite* or *Modular Test Suite* in the *New document type* list.
4. Type **`Example_A`** in the *New document name* field.
5. Make sure that the option *Show in editor* is selected.
6. Click the *OK* button.

   A new TTCN document of type test suite or modular test suite is created. At the same time, a TTCN icon is created in the Organizer. After that, the TTCN Browser window is opened. The Browser will show the new test suite in a collapsed format.

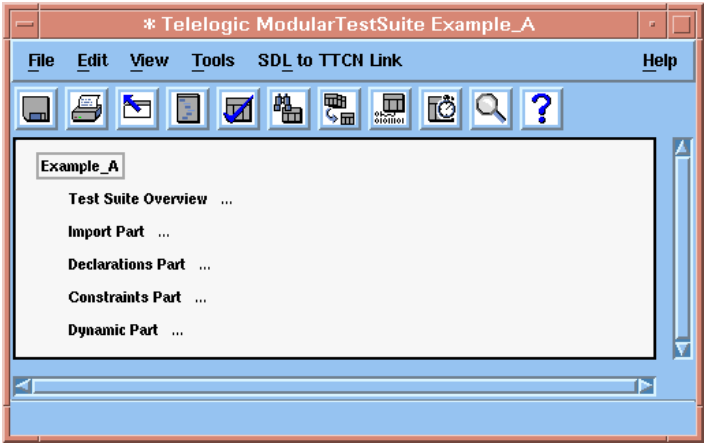


Figure 32: The Browser window with a collapsed test suite

Using the Browser

What You Will Learn

- To expand and collapse the test suite
- To add TTCN tables to the test suite

Expanding and Collapsing the Test Suite

The Browser displays the test suite in a collapsed format, which is indicated by the three dots after the items in the test suite.

To expand the entire test suite:

1. Select the top node in the Browser, that is *Example_A*.
2. Select *Expand Tree* from the *View* menu.
   - It is also possible to open the pop-up menu on *Example_A* and select *Expand Tree* from it.

   All the collapsed items in the Browser are expanded.

Shortcut:

- `<Shift+e>` (*Expand Tree*)

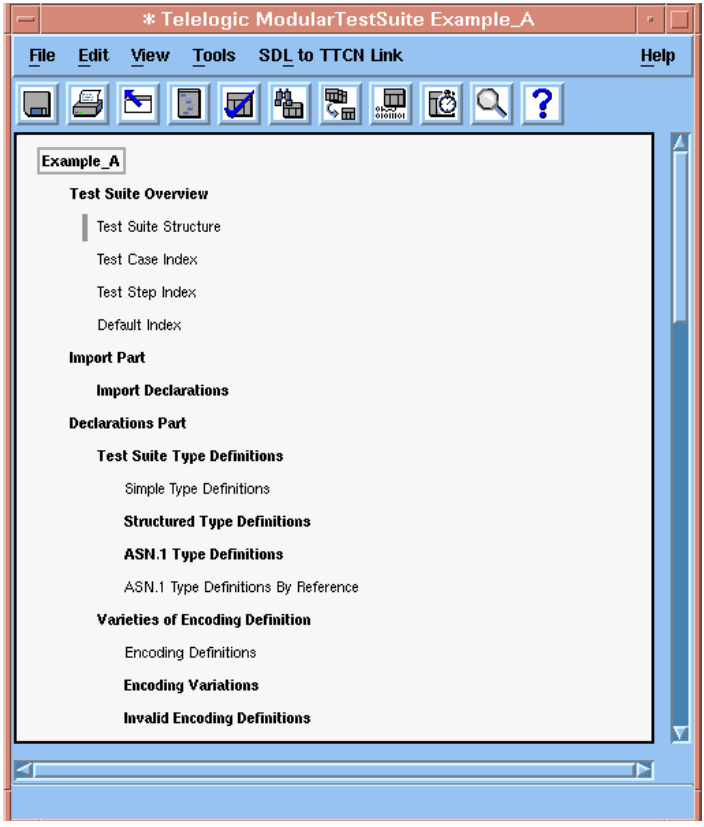


Figure 33: The Browser window with the expanded modular test suite and no selected items

You may also want to deselect the test suite:

3. Deselect the test suite by selecting *Deselect All* from the pop-up menu.

Shortcut:

- `<Ctrl+\>` (*Deselect All*)

To collapse the test suite:

- Open the pop-up menu on *Example_A* and select *Collapse* from it.

Shortcut:

- `c` (*Collapse*)
- `e` (*Expand* – does not have the same effect as *Expand Tree*)
- `<Shift+e>` (*Expand Tree*)

Note that *Expand* and *Collapse* only work on a **single** selection. If more than one item or if no item is selected, the *Collapse*, *Expand* and *Expand Tree* commands are dimmed. In the following, it is assumed that the test suite is completely expanded in the Browser.

You should also note that items in **bold** font represent the static (structural) parts of the test suite that cannot be opened or edited. The items in normal, plain font represent TTCN tables, which of course can be opened and edited.

Building a Test Suite

You are now going to add a simple TTCN table to your test suite.

To add a PCO Type to *Example_A* in the Browser:

1. Select *PCO Type Declarations* in the *Declarations Part*.
2. Select *Add* from the Browser *Edit* menu.

   Note that *Add* only works when a **single** item is selected.

Shortcut:

- `<Ctrl+Shift+Ins>` (*Add*)

A PCO type with the temporary name *NoName* is added in the *PCO Type Declarations* list.

3. Rename the PCO type *NoName* by opening the pop-up menu on *NoName* and selecting *Rename* from it.

Shortcut:

- First click on *NoName*, then press `r` (*Rename*).

It is now possible to type the new name. In this example we will call the PCO type **`LOWER_PCO`**.

4. In a similar manner as described above, you should also add the following items:

   – A TTCN PCO called **`L`**
   (*Declarations Part > PCO Declarations*)

   – A TTCN PDU called **`SEND`**
   (*Declarations Part > PDU Type Definitions > TTCN PDU Type Definitions*)

   – A TTCN PDU called **`RECEIVE`**
   (*Declarations Part > PDU Type Definitions > TTCN PDU Type Definitions*)

   – A TTCN PDU constraint on the SEND PDU called **`S1`**
   (*Constraints Part > PDU Constraint Declarations > TTCN PDU Constraint Declarations*)

   – A TTCN PDU constraint on the RECEIVE PDU called **`R1`**
   (*Constraints Part > PDU Constraint Declarations > TTCN PDU Constraint Declarations*)

   – A test case called **`TEST_CASE_1`**
   (*Dynamic Part > Test Cases*)

   – A test step called **`TEST_STEP_1`**
   Dynamic Part > Test Step Library)

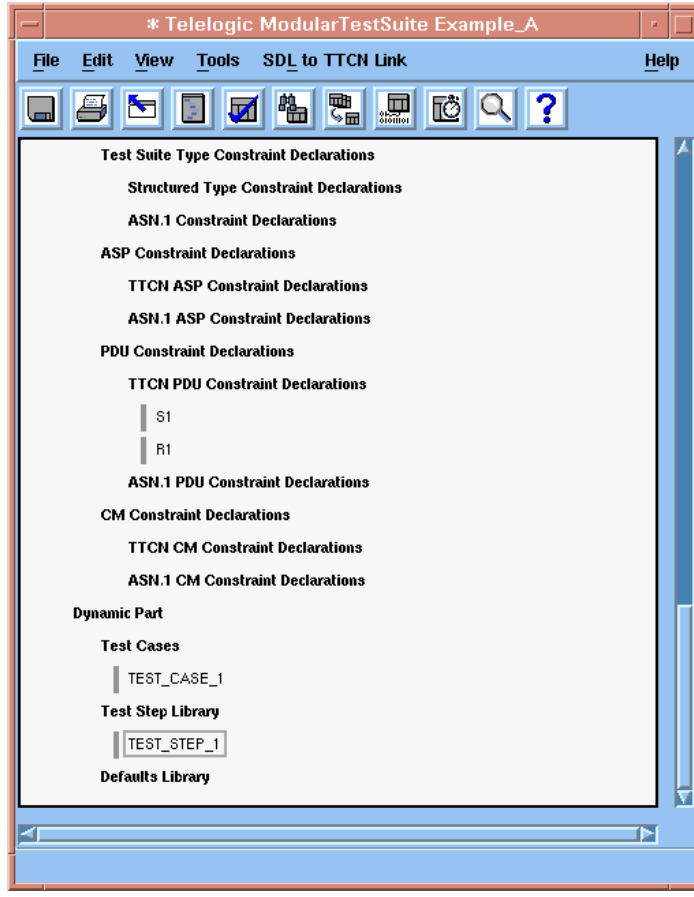


Figure 34: The Browser window showing some of the newly added items

The next step is to edit the tables that you just added.

Using the Table Editor

What You Will Learn

- To open the Table Editor
- To edit the contents of a table

Opening the Table Editor

The Table Editor window is opened when you double-click on a table in the Browser window.

- Double-click the test case *TEST_CASE_1*.

  The test case table is opened in the Table Editor window.

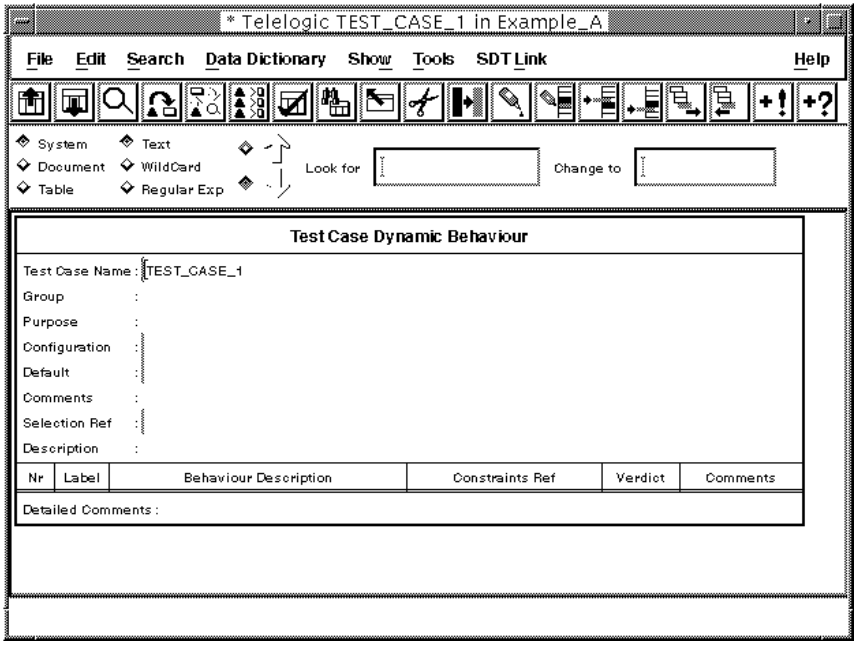


Figure 35: The test case TEST_CASE_1 which has not yet been edited

Editing the Test Case Table

As you can see, the TEST_CASE_1 table, or any other table, consists of fields where text may be inserted and edited. You are now going to edit the contents of TEST_CASE_1:

1. Click in the *Purpose* field and type some text, for example:
   `This is an example test case for the TTCN tutorial`.
2. Type some text in the *Description* field, e.g. **`Example test case`**.
   – Instead of clicking the mouse to set the input focus in the *Description* field, you may also press `<Ctrl+Down arrow>` until the cursor has reached the *Description* field.

   It is also possible to type text in the other fields but you do not have to do that in this tutorial. Note that the *Group* field is not editable. The contents of this field is always kept updated by the TTCN suite from the Browser structure.
3. Press `<Ins>` or `<Insert>`.

   A new, automatically numbered, empty line is added to the body of the table.
4. Type **`L! SENT`** in the *Behaviour description* field of the new line.

Note:

The misspelling of *SEND* is intentional!

5. Type **`S1`** in the *Constraints Ref* field.
6. Press `<Ins>` or `<Insert>` to add another new line.
7. Type **`+TEST_STEP_1`** in the *Behaviour Description* field of row 2.

   Note that the text is automatically indented.

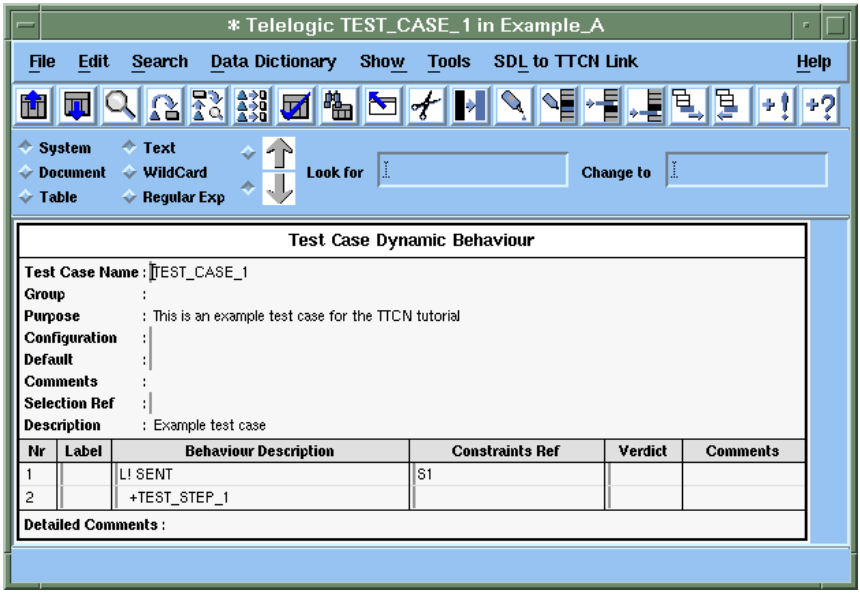


Figure 36: The test case TEST_CASE_1 when it has been edited. The misspelling of "SEND" is intentional.

Copying and Pasting Text and Table Rows

Before you close the editor you may want to try to copy and paste text and rows in the table:

- If you only want to copy text, you simply select and copy it, either by a menu choice or shortcut. To paste the text, you can either use a menu choice or shortcut.
- If you want to copy an entire row in the body of a table, you select it by pressing `<Ctrl>` while at the same clicking in the row. (A row in a dynamic behaviour table is selected if you click in the *Nr* column). When the row has been selected you can press `<Ctrl+c>` to copy it. You paste it with `<Ctrl+Meta+v>` (to paste after selected row) or `<Ctrl+Shift+v>` (to paste last in the body of the table).

Shortcut:

- `<Ctrl+x>` (*Cut* a row)
- `<Ctrl+c>` (*Copy* a row)
- `<Ctrl+v>` (*Paste* a row)
- `<Ctrl+Meta+v>` (*Paste After*)
- `<Ctrl+Shift+v>` (*Paste Last*)
- `<Ctrl+Right arrow>` (moves the input focus right)
- `<Ctrl+Left arrow>` (moves the input focus left)
- `<Ctrl+Down arrow>` (moves the input focus down)
- `<Ctrl+Up arrow>` (moves the input focus up)

Note:

There are two paste buffers: one for plain text and one for table rows.

When you have finished copying and pasting, make sure that the contents of the table are exactly as in Figure 36.

Closing the Table Editor

- When you have edited TEST_CASE_1, close the table from the *File* menu.

Completing the Test Suite

Now you should edit the other tables that you have already added to the test suite. Do this in a similar manner as described above, by using the tables in the following figures as models.

1. Edit the tables in the *Declarations Part* of the test suite, that is the PCO type *LOWER_PCO*, the PCO called *L* and the PDUs called *SEND* and *RECEIVE*:

PCO Type Declarations		
PCO Type	Role	Comments
LOWER_PCO	LT	
Detailed Comments :		

Figure 37: The PCO type LOWER_PCO

PCO Declarations			
PCO Name	PCO Type	Role	Comments
L	LOWER_PCO	LT	
Detailed Comments :			

Figure 38: The PCO L

PDU Type Definition			
PDU Name : SEND			
PCO Type : LOWER_PCO			
Encoding Rule Name :			
Encoding Variation :			
Comments :			
Field Name	**Field Type**	**Field Encoding**	**Comments**
Field_A	INTEGER		
Field_B	BOOLEAN		
Detailed Comments :			

Figure 39: The PDU SEND

PDU Type Definition			
PDU Name : RECEIVE			
PCO Type : LOWER_PCO			
Encoding Rule Name :			
Encoding Variation :			
Comments :			
Field Name	**Field Type**	**Field Encoding**	**Comments**
Field_A	INTEGER		
Field_B	BOOLEAN		
Detailed Comments :			

Figure 40: The PDU RECEIVE

2. Edit the tables in the *Constraints Part* of the test suite, that is the PDU constraints called *S1* and *R1*:

PDU Constraint Declaration

Constraint Name : S1
PDU Type : SEND
Derivation Path :
Encoding Rule Name :
Encoding Variation :
Comments :

Field Name	Field Value	Field Encoding	Comments
Field_A	1		
Field_B	FALSE		

Detailed Comments :

Figure 41: The PDU constraint S1

PDU Constraint Declaration

Constraint Name : R1
PDU Type : RECEIVE
Derivation Path :
Encoding Rule Name :
Encoding Variation :
Comments :

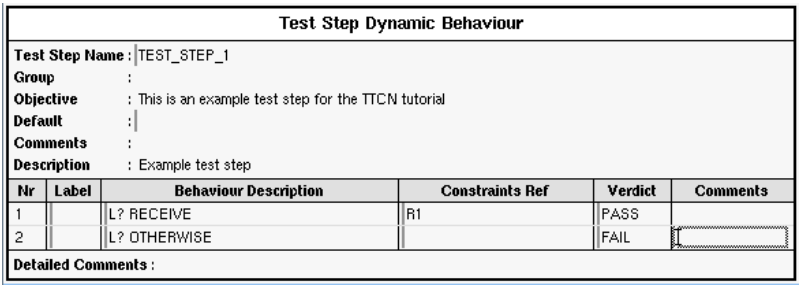
Field Name	Field Value	Field Encoding	Comments
Field_A	2		
Field_B	TRUE		

Detailed Comments :

Figure 42: The PDU constraint R1

3. Edit the test step called *TEST_STEP_1* in the *Dynamic Part* of the test suite:

   §When you add row 2 it is automatically indented, however, in this



Test Step Dynamic Behaviour

Test Step Name : TEST_STEP_1
Group :
Objective : This is an example test step for the TTCN tutorial
Default :
Comments :
Description : Example test step

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		L? RECEIVE	R1	PASS	
2		L? OTHERWISE		FAIL	

Detailed Comments :

Figure 43: The test step TEST_STEP_1

   case it should not be. To decrease the indention:

   – Select the entire line by clicking in the *Nr* column. Then select *Decrease Indent* from the *Edit* menu.

     (The shortcuts are <-> and <+> on the right-hand keypad.)

4. Close all Table Editors when you have finished editing.
5. Save the test suite by selecting *Save* in the *File* menu. A *Save As* dialog is displayed.
6. Click OK.

Analyzing the Test Suite

What You Will Learn

- To analyze a test suite
- To find errors

Analyzing the Test Suite

You are now going to analyze the test suite:

1. Select *Analyze* from the Browser *Tools* menu.

   The *Analyzer* dialog is opened. You do not have to change the settings in this tutorial.

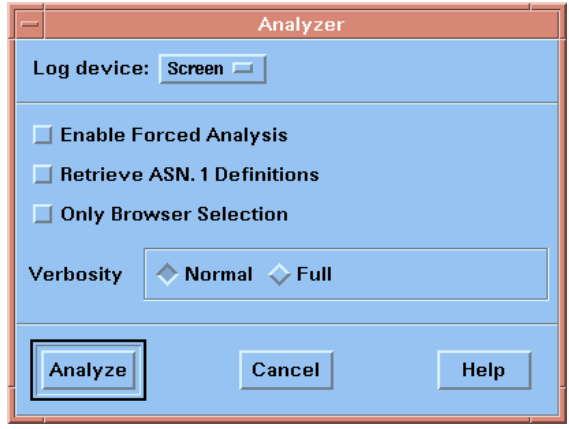


Figure 44: The Analyzer dialog

2. Click *Analyze*.

   The log window is opened. If you have edited the test suite as described above, the log should show a single error message:

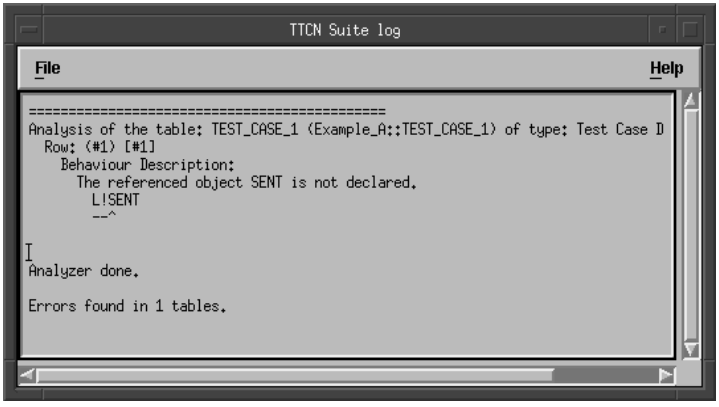


Figure 45: The TTCN suite log window showing one error

The log text means that there is an error in line 1 of the *Behaviour Description* of the test case dynamic behaviour table called *TEST_CASE_1*.

Finding and Correcting the Error

To find the erroneous table:

1. Select the test case name in the log.

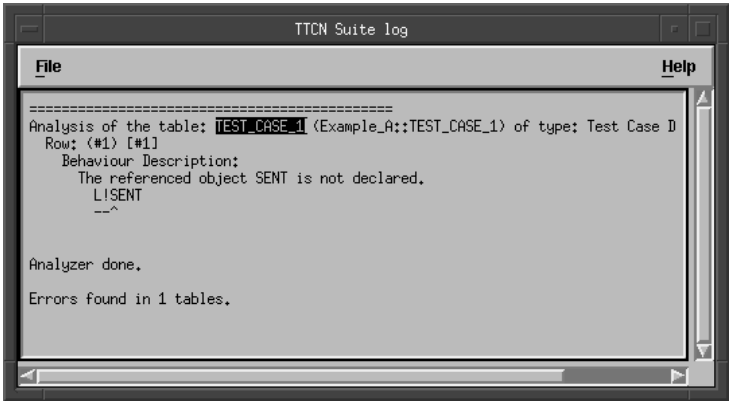


Figure 46: Selecting text in the TTCN suite log

2. Select *Find Table* from the Browser *Tools* menu.

   The table will be found and displayed. In the first behaviour line you can see that you have written *SENT* instead of *SEND*.

   Note that the error line is marked in red. In the Browser, the erroneous table is also marked with a red bar.

3. Correct the error, i.e. change *SENT* to *SEND*.

4. Analyze the table by selecting *Analyze* from the Table Editor *Tools* menu.

   You will now have a small test suite that is syntactically correct. This means that the red markings will disappear.

   You may now close the table editor and log windows.

Saving a TTCN Test Suite Document

What You Will Learn

- To save a TTCN document
- To change its file name and/or its format

Save As Document

When you want to save a newly created document into a file, you must make a number of choices in the *Save As* operation:

1. Select `Save As` from the `File` menu in the Browser.
2. Select *Binary* (TTCN-GR) or *Text* (TTCN-MP).

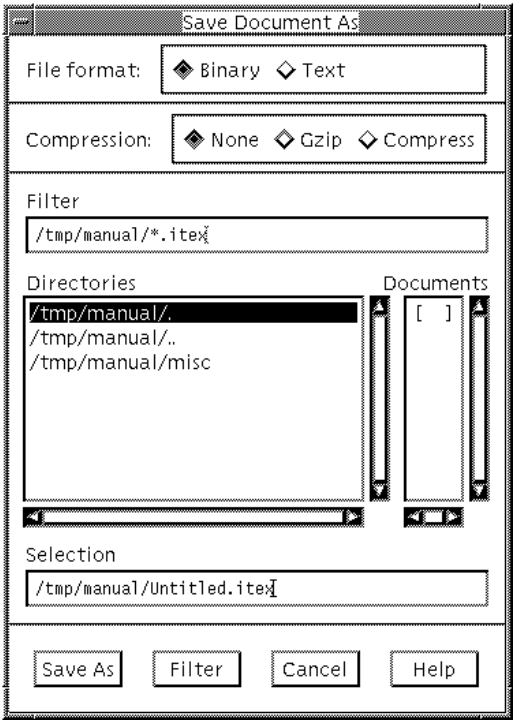


Figure 47

3. If you chose *Binary*, you need to select *None*, *Gzip* or *Compress*.[1]
4. Select a file name.
5. Press *Save As*.

   At the same time, the TTCN icon in the Organizer is associated with the specified file name.

Save Document

To save a document you can use either the *Save Document* item in the *File* menu of the Browser, or use the left most button in the toolbar of the Browser. The *Save Document* operation saves the document on disk with the same file name and format as before. If you try to save a document which has no file name assigned yet, the *Save As* operation will be initiated instead.

1. For maximum compatibility, the None selection should be used. The Gzip selection is preferred over Compress, both for portability and performance.

Creating TTCN Tables in Other Ways

The methods described below make it faster and more efficient to create TTCN tables. They also avoid annoying spelling errors and reduces the amount of text that needs to be typed.

What You Will Learn

- To create a table by copying and pasting
- To create a table by using the *Data Dictionary* menu
- To delete a table

Copying and Pasting

You shall now practice another way of creating a TTCN table, namely by copying and pasting it.

1. Find the PDU called *SEND* in the Browser.
2. Copy the *SEND* PDU by using the popup menu.
3. Find the PDU Constraint called *S1*.
4. Open the pop-up menu on *S1* and select *Paste Before* from it.

   The *SEND* copy is pasted before *S1*.

Editing the New Table

1. Open the new *SEND* table.

   The Table Editor window is opened displaying the table. As you can see, the *PDU Type* field and the *Field* names are filled in. Now you just have to change the name and insert values in *Field_1* and *Field_2*.

2. Type a new name in the *Constraint Name* field, e.g. `S2`.
3. Give *Field_A* the value `3` and *Field_B* the value `TRUE` in the *Field Value* column.
4. Analyze the entire test suite as described in "Analyzing the Test Suite" on page 85.

Using the Data Dictionary

This section contains an example of an efficient way of creating test cases. Start by creating a new test case:

1. Create a new test case.
2. Name the test case, for example **`TEST_CASE_2`**.
3. Open the test case.
4. Select *Add Send Statement* from the Table Editor *Data Dictionary* menu. The *Add Send* dialog is opened.

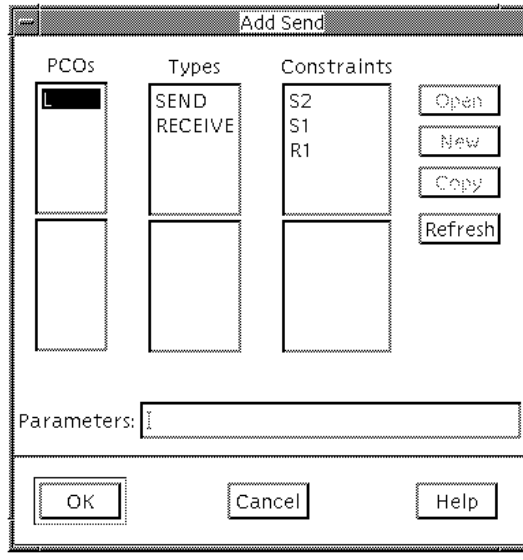


Figure 48: Add Send dialog

5. Click on *S2* in the *Constraints* list.
6. Click *OK*.

   A send statement has now been automatically generated.
7. Select the generated line in the Table Editor by clicking in the *Nr* column.

8. Select *Add Attach Statement* from the Table Editor *Data Dictionary* menu. The *Add Attach* dialog is opened.

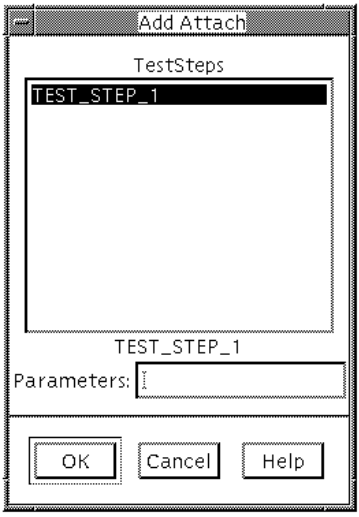


Figure 49: Add Attach dialog

There is only one test step available (i.e. *TEST_STEP_1*) so this will be automatically selected.

9. Click *OK*.

A new line has been added to the table.

Deleting the Tables

For the remainder of the tutorial you will not need the two tables that you have just created. You should therefore delete them.

1. Select *Deselect All* from the pop-up menu in the Browser.
2. Select *TEST_CASE_2*.
3. Select the PDU Constraint *S2*, while at the same time pressing `<Ctrl>`.
4. Select *Delete* from the *Edit* menu. The items are deleted.

Selecting Browser Items

The Selector is a tool that you may use when you want to make selections of Browser items. Before you apply the Selector, the Browser must already contain a selection.Then you can specify, with the Selector, if you want to increase, decrease or replace the existing selection.

Based on the selections in the Browser, you can make sub Browsers. A sub Browser works as the normal TTCN Browser, but it does not contain the entire test suite – only selected parts.

What You Will Learn

- To use the Selector tool
- To create a sub Browser

Selection 1

Suppose that you wish to select all the tables in the test suite that reference the PDU called *SEND*:

1. Deselect the entire test suite.
2. Select the single PDU called *SEND*.
3. Select *Selector* from the Browser *Tools* menu.

   The *Selector* dialog is opened:

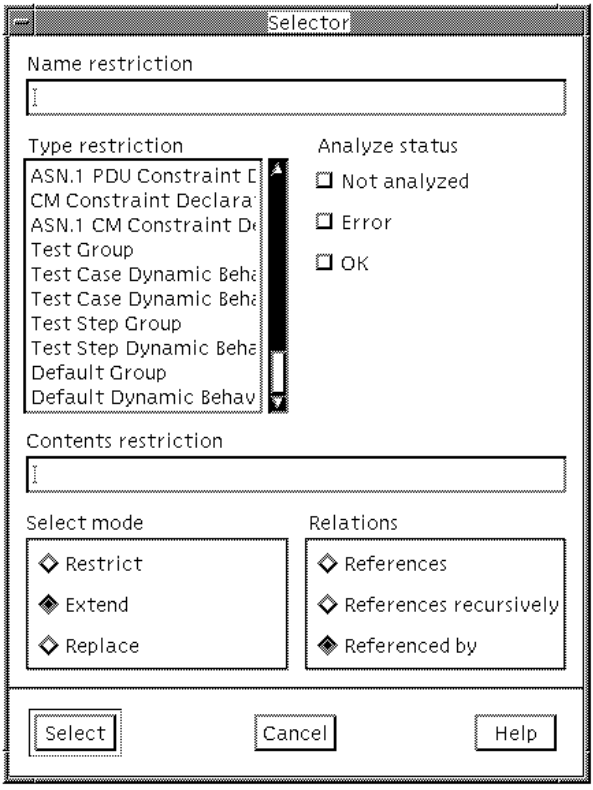


Figure 50: The Selector dialog

4. Select the *Extend* option in *Select Mode*.
5. Choose the *Referenced by* option in the *Relations* box.

   You do not have to change any other options.
6. Click the *Select* button.

   Now take a look at the Browser. You should see that not only is the *SEND* PDU selected but also the constraint *S1* and the test case *TEST_CASE_1*. Only these objects reference the *SEND* PDU. (You may have to scroll the Browser to see them all.)

Selection 2

As another example, suppose that you wish to find all behaviour tables that have the character *1* included in their identifier and have a *PASS* verdict in the table:

1. Select the entire test suite.
2. Select *Selector* from the Browser *Tools* menu.

   The *Selector* dialog is opened.
3. Type `1` in the *Name restriction* field.

   This means that the names of the tables that you want to select should include the character *1*.
4. Select *Test Case Dynamic Behaviour*, *Test Step Dynamic Behaviour* and *Default Dynamic Behaviour* in the *Type Restriction* box.
5. Type `PASS` in the *Content restriction* field.

   This means that there must be at least one occurrence of the word *PASS* in the selected tables.
6. Select *Restric*t in the *Select mode* box.

   In other words, the intention is to select all behaviour tables that have a *1* in their names and that have a *PASS* substring in the contents of the table.

   The *Analyze status* and *Relations* options should not be set.
7. Click the *Select* button.

   Only *TEST_STEP_1* is selected in the Browser window.

Selection 3

Compare the result of the selection above with the following:

1. Select the entire test suite.
2. Apply the Selector with **almost** the same options as described above.
   - The difference is that you should remove *PASS* from the *Content restriction* field, i.e. the field should be empty.

3. Click the *Selector* button.

   This time, both *TEST_CASE_1* and *TEST_STEP_1* are selected, because a *PASS* substring does not appear in the test case.

Creating a Sub Browser

It might be suitable at this point to create a sub Browser of the selection that you have just created (i.e. just the items *TEST_CASE_1* and *TEST_STEP_1*):

- Select *Browser* from the Browser *Tools* menu.

  A sub Browser containing the selected objects is created, together with the necessary minimal static structure to glue them together.

  You will not need this sub Browser in this tutorial so you may close it if you wish.

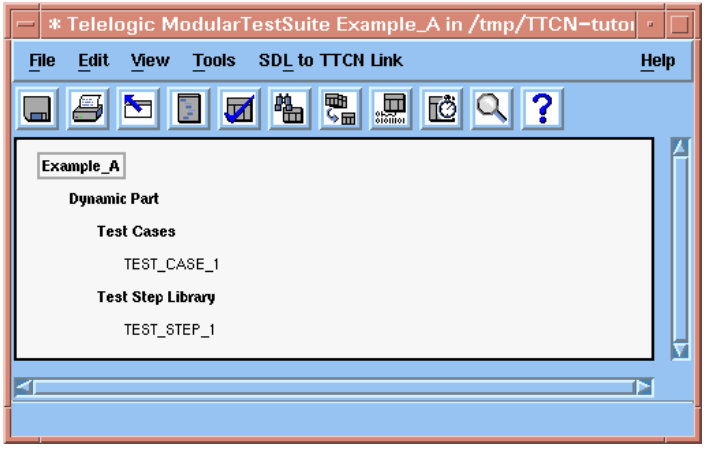


Figure 51: A sub Browser containing TEST_CASE_1 and TEST_STEP_1.

Generating Overview Tables

To complete the test suite, you also have to generate the *Test Suite Overview* tables – that is the *Test Suite Structure*, the *Test Case Index*, the *Test Step Index* and the *Default Index* tables – and the *TTCN Module Overview* – that is the *TTCN Module Structure* and the *Index* tables.

None of these tables are editable. Instead, you have to make the changes in the corresponding tables. The reason for this is that the overview tables should be consistent with the TTCN document.

To generate the overview:

1. Select *Generate Overview* from the Browser *Tools* menu.

   The *Generate Document Overview* dialog is opened.

   The TTCN suite also generates the page numbers. You can set the start page number in this dialog, but you do not have to do that in this tutorial.

2. Click the *Generate* button in the dialog.

3. Open the *Test Case Index* table.

   You will see that the *Description* field has been generated from the additional *Description* field in the header of the test case. To make changes, you have to edit the tables from which the overview was generated and then generate the overview again.

4. Close the *Test Case Index* table.

Printing the Test Suite

You should by now have a test suite that is syntactically correct and which includes an up to date overview. If you want to, you can print it.

Printing the Entire Test Suite

To print the whole test suite:

1. Select the entire test suite.
2. Select *Print* from the Browser's *File* menu.

   The *Print Document* dialog is opened.
3. Make sure that *Output Device* names a printer that is recognized by your system.

   You do not have to change any other settings in this tutorial.
4. Click the *Print* button if you want to print the entire test suite.

Printing Parts of the Test Suite

It is also possible to print parts of the test suite.

To print, say, just the Constraint tables:

1. Select only *S1* and *R1*.
2. Select *Print* from the Browser *File* menu.

   The *Print Document* dialog is opened.
3. Make sure that *Output Device* names a printer that is recognized by your system.

   You do not have to change any other settings in this tutorial.
4. Click the *Print* button if you want to print the Constraint tables.

Creating Reports

The Reporter tool is used for presenting status information on selected items in the Browser. The information may for example be analysis status and modification date.

To make a list of the full amount of information:

1. Select the entire test suite.
2. Select *Reporter* from the Browser *Tools* menu.

   The *Reporter* dialog is opened.

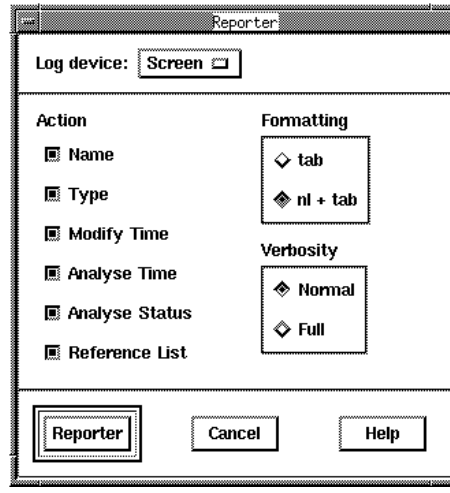


Figure 52: The Reporter dialog

3. Set the options as shown in Figure 52, that is select all options in the list of actions, normal verbosity and the formatting *nl + tab*. The latter means that each list entry will be printed on a *n*ew *l*ine and the components in the list entry will be separated by tabs.
4. Click the *Reporter* button.

   The options set in the dialog will produce the full amount of information available, a portion of which is illustrated below:

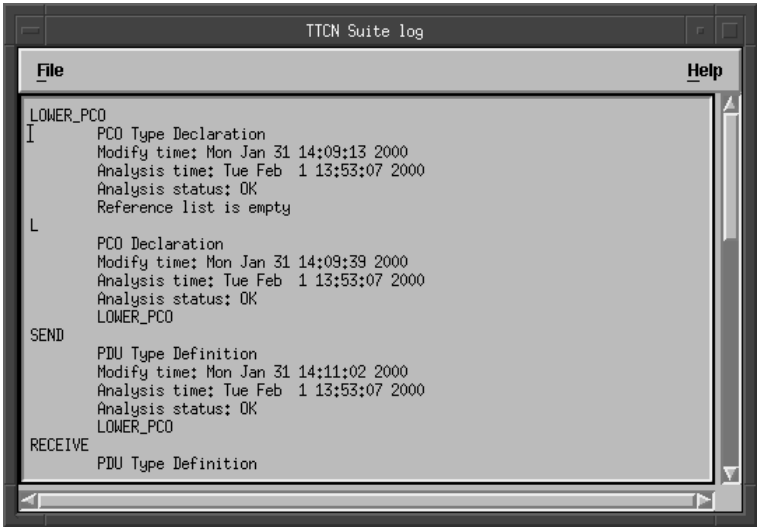


Figure 53: Test suite information

Note that, as with all the TTCN suite log files, this file can be saved. This may be useful if you wish to print the file or process it with non-TTCN suite tools.

If you want to, you can apply the Reporter again and experiment with other settings.

You may also find it practical to apply the Find Table tool to text that is marked in the log window:

1. Mark the name of a table in the log window
2. Select *Find Table* from the Browser *Tools* menu.

   The table is found and opened.

Exporting and Importing

In the following examples, you will use the menu choices *Convert to MP* in the Browser and *Convert to GR* in the Organizer for exporting and importing TTCN-MP documents from and to the TTCN suite. However, you can also use *Save As* in the TTCN suite for changing the document format. In addition, TTCN-MP documents may be opened directly in the TTCN suite.

What You Will Learn

- To export a test suite to TTCN-MP format
- To import a test suite from TTCN-MP format

Exporting a Test Suite to MP Format

You shall now convert the test suite to TTCN-MP format:

1. Select the entire test suite in the Browser window.
2. Select *Convert to MP* from the *File* menu.

   The *Convert to MP* dialog is opened, in which you may specify the name of the new document and where it is to be saved.

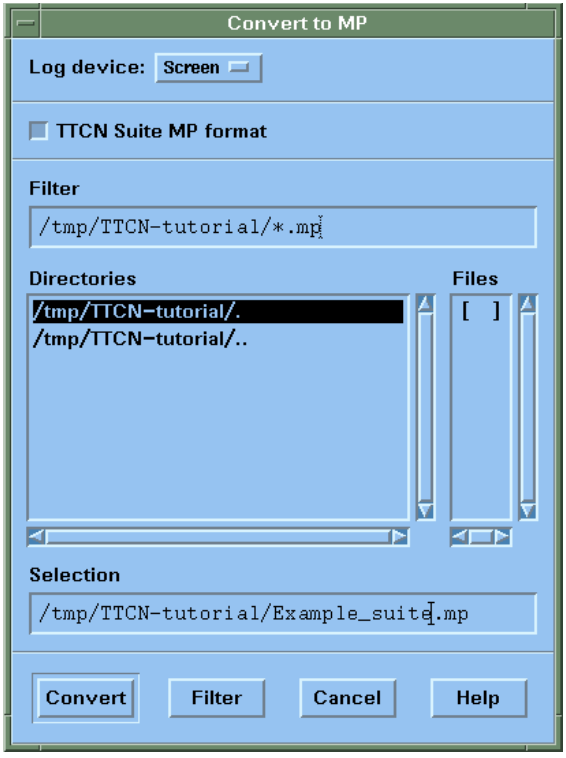


Figure 54: The Convert to MP dialog

3. Select the directory path in the *Directories* box.
4. Type the file name that you wish the exported file to be called. In this example the file name is **`Example_suite.mp`**.

   Note the suffix `.mp` (used by convention). You are now ready to convert the file.
5. Click *Convert* to export the test suite.

   The TTCN-MP file for the test suite can now be found in the file `Example_suite.mp`. You can check it if you like.

Importing a Test Suite from MP Format

Your next task is to import the TTCN-MP file that you have just exported. Do not close the existing open test suite – you need that later.

1. Select *Convert to GR* from the *Generate* menu in the Organizer. The *Convert to GR* dialog is opened:

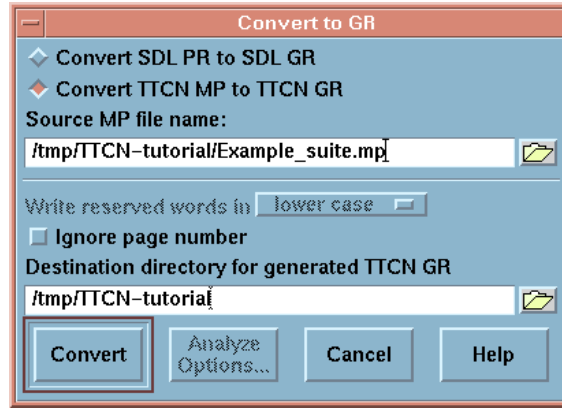


Figure 55: The Convert to GR dialog

2. Select *Convert TTCN MP to TTCN GR*.
3. Click the folder icon of the *Source MP file name* field. The *Select Source MP file* dialog is opened.
4. Click the file that you want to convert, when you have found it in the *Files* list. In this case the file is `Example_suite.mp`.
5. Click *OK*.
6. Click the folder icon of the *Destination directory for generated TTCN GR* field. The *Select Destination Directory* dialog is opened.
7. Select the destination directory, i.e. where you want the converted document to be saved.
8. Click *OK*.
9. Click the *Convert* button in the *Convert to GR* dialog.

The file is converted and is stored in a file with a generated file name in the given directory. The generated file name is the MP file name with the extension `.itex`. This is shown in the Organizer log.

Note:

You can open and work with MP-files just as you do with GR-files. All conversions to and from MP will then be done transparently.

Now perform the following:

1. Select the *TTCN Test Specification* chapter in the Organizer.
2. Select *Add Existing* in the *Edit* menu in the Organizer. The *Add Existing* dialog is opened.
3. Select the file that you just converted (`Example_suite.itex`) and click *OK*.

   Either type the filename and the path or click the folder button to select the file.
4. Make sure that the *Show in editor option* is selected.
5. Click *Add*.

   The test suite is now added in the TTCN Test Specification chapter and it is opened in the Browser.
6. In the Browser, rename this test suite as **`Example_B`**.
7. Expand the entire test suite.
8. Analyze the entire test suite.
9. Do **not** close *Example_B*, you will need it in the following exercise.

Replacing, Comparing and Merging

In this exercise you are going to merge the two test suites, the *Example_A* and the *Example_B* that you have just created. First you should change some names in one test suite though – to make it different – and then compare it with the other.

What You Will Learn

- To start search for a specified pattern and to replace matches
- To compare two TTCN documents
- To merge two TTCN documents

Searching and Replacing

The first thing you should do is to change some text in *Example_B*. The reason for this is that there would be no use comparing the documents – which you are soon going to do – if they both are the same.

You can start the search from both the Browser and the Table Editor, and in this case you will do it from the Browser:

1. In the Browser displaying *Example_B*, click the *Search* button.

   The Table Editor will be opened, and as you can see it is empty.

2. Type `1` in the *Look for* field
3. Click the *Search* button.

   The first table of the test suite containing `1` is opened and `1` is highlighted.

4. Type `2` in the *Change to* field.

5. Click the *Replace* button.

   `1` will be changed to `2` and it is no longer highlighted.

6. Click the *Search* button again.

   This will find another occurrence of `1`.

7. Click the *Proceed* button.

   This is the same as first clicking *Search* and then *Replace*. Another occurrence of `1` will be found.

8. Click the *Replace all* button.

   This will change all occurrences of `1` to `2`. The Table Editor will display the table in which the final replacement was made and the status bar will show the total number of replacements.

Comparing Two Documents

When you have changed some text in *Example_B*, you can compare it to *Example_A* to see if any similarities exist:

1. Ensure that the test suites *Example_A* and *Example_B* are opened.
2. Select the entire test suite *Example_B*
3. Select *Compare* from the Browser *Tools* menu.

   The *Compare Documents* dialog is opened:

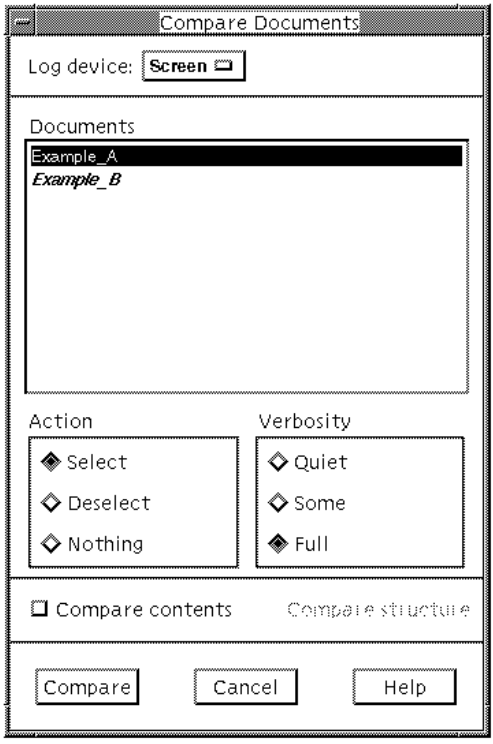


Figure 56: The Compare dialog

4. Make the dialog settings as depicted in Figure 56.

   This will compare the test suite *Example_A* with the selection that you made in *Example_B*, in this case the entire test suite.

   Also make sure that *Example_A* is selected in the *Documents* field in the dialog.

5. Click the *Compare* button.

   The comparison will deselect all items in the Browser for *Example_B* that do **not** match with items in *Example_A*. What remains are the items that are the **same** in both test suites, namely the lower PCO *L* and the PDUs *SEND* and *RECEIVE*. These tables will also be presented in the TTCN suite log.

6. Delete the selected items from *Example_B*.

   The only items left now are the ones that differ between the two test suites. You are now ready to try a merge.

Merging Two Documents

The Merge tool is used for merging one TTCN document (complete or partial) into another. This only works on condition that the documents do not conflict, that is, if an item in one document has the same name as another item in the other document. This will not be a problem now, as you have already compared the documents and deleted the similarities.

The final exercise in this tutorial is that you should merge what is left of *Example_B* into *Example_A*:

1. Select the entire suite *Example_B*.
2. Select *Merge* from the Browser *Tools* menu.

   The *Merge Documents* dialog is opened:

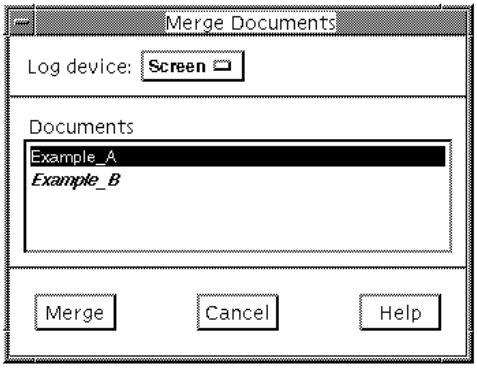


Figure 57: The Merge Documents dialog

3. Select *Example_A* in the *Documents* chapter. That is the suite that you are going to merge *Example_B* into
4. Click the *Merge* button.

   If you look at the *Example_A* Browser, you should see that the suites have been merged into one. This is also depicted in Figure 58.

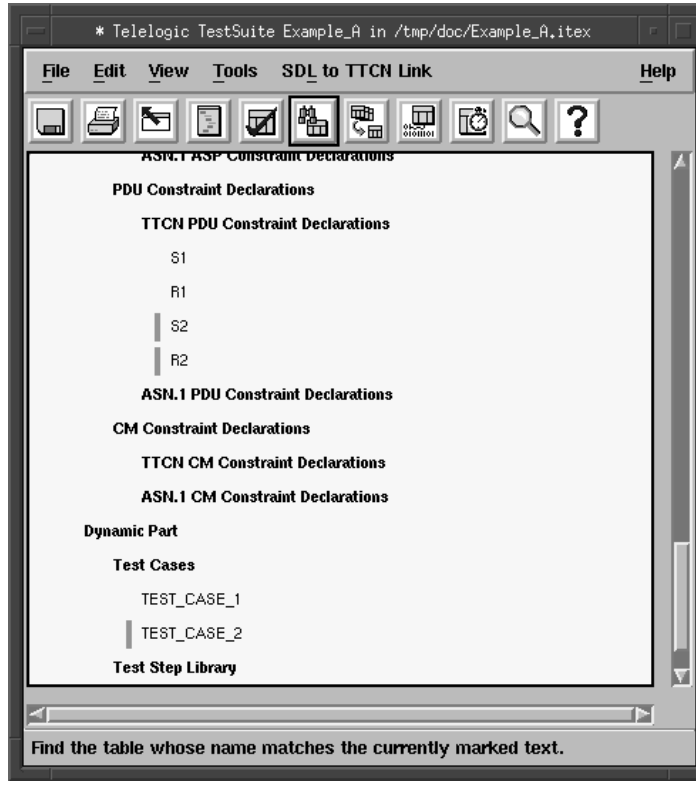


Figure 58: The Example_B has been merged into Example_A

So Far...

You should now have learned how to create a test suite and what the test suite looks like in the Browser. You have also learned to create and edit tables and how to work with the Table Editor. Other things you should have learned is how to analyze the test suite and how to find errors.

Some other TTCN suite functionality that you have used are selecting, generating the overview, printing, making reports, converting to MP and back to GR, replacing, comparing and merging.

By practicing this tutorial you have probably not achieved any knowledge about TTCN. If you want to know more about the basics of TTCN you may read the TTCN Suite Methodology Guidelines. That volume is, however, not a hands-on tutorial on TTCN.

The following tutorial is chapter 7, *Tutorial: TTCN-SDL Co-Simulator (on UNIX)*. Before you start practising that, you should know how to use the SDL Simulator. A tutorial on that can be found in *chapter 4, Tutorial: The SDL Simulator, in the SDL Suite Getting Started*.