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Technical Report

Methods for Testing and Specification (MTS); Portability of SDL specifications

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Contents

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS).

The present document is part 2 of a multi-part Technical Report describing how SDL can be formally used by technical bodies, as identified below:

Part 1: "Portability of SDL specifications";

Part 2: "Application of object-oriented SDL features in B-ISBD specifications".

Introduction

In its effort to further improve technical quality of standards ETSI is increasing the use of formal languages in the standards development process. The ETSI Interim Technical Working procedure states: "ETSI Standards shall, where applicable, use standardized languages and notations (such as Specification and Description Language (SDL) in ITU-T Recommendation Z.100 [2], Message Sequence Chart (MSC) in ITU-T Recommendation Z.120 [4], Abstract Syntax Notation One (ASN.1) in ITU-T Recommendation Z.105 [3] and Tree and Tabular Combined Notation (TTCN)). Non-standard languages and notations may be used only when no applicable language or notation exists".

The use of the above mentioned languages is practically impossible without dedicated tools. Such tools are in use within ETSI itself, in other standardization bodies such as ITU-T, and in ETSI member organizations.

Currently ETSI standards are distributed as hard copy documents, but the trend is towards electronic distribution. The inclusion of SDL models in standards raises certain issues in this context. The intention is that it should in principle be possible to, using adequate tool support, execute/simulate the components of a standard that are defined in SDL. The distribution of such executable SDL models have a clear value for the standard users. Possible use is for example for educational purposes, basis for design, analysis etc.

For this approach to be a success, tool independent and freely interchangeable SDL models are a necessity. This TR is the result of a study performed by the ETSI Technical Committee MTS with the aim of investigating the possibilities for electronic exchange of SDL specifications between SDL tools.

This TR is not a tool comparison, and the results are not intended for such purposes.

1 Scope

The present document establishes the degree of portability of SDL, MSCs and ASN.1 descriptions between a number of selected SDL tools.

This TR is applicable to ETSI deliverables containing SDL, MSCs and ASN.1 descriptions.

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ETS 300 414 (1995): "Methods for Testing and Specification (MTS); Use of SDL in European Telecommunications Standards (Rules for testability and facilitating validation)".

[2] ITU-T Recommendation Z.100 [2] (1994): "CCITT Specification and Description Language (SDL)".

[3] ITU-T Recommendation Z.105 (1994): "SDL combined with ASN.1".

[4] ITU-T Recommendation Z.120 (1993): "Message Sequence Chart (MSC)".

[5] ITU-T Recommendation Z.106 [5] (1996): "Common Interchange Format (CIF)".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ASN.1	Abstract Syntax Notation One
B-ISDN	Broadband Integrated Services Digital Network
CIF	Common Interchange Format
CS2	Intelligent Networks Capability Set 2
INAP	Intelligent Network Application Protocol
MSC	Message Sequence Chart
SDL	Specification and Description Language

4 Content of study

4.1 Selected tools

The tools selected for the study are ObjectGEODE (Verilog, France, version 1.0), SDT (Telelogic, Sweden, version 3.0.2)and SICAT(Siemens, Germany, version 13). The selected tools represent the majority of ETSI member's choice of SDL tools.

NOTE: Some of the problems identified in this report, may have been solved in later versions of the tools.

4.2 Selected SDL concepts

The investigation of interchange capabilities covers the SDL concepts that are considered as necessary in standardization work. The use of different SDL-88 constructs in ETSI standards is regulated by ETS 300 414 [1], which classifies the SDL-88 concepts into three different classes as shown in table 1.

Table 1: Selection of SDL-88 concepts

	Unrestricted use allowed	Restricted use allowed	Not allowed
System or block diagrams	block, channel, comment, package, process, process create line, select, signal list, signal route, text, text extension	block substructure, data type definition, macro call, signal declaration	channel partitioning, signal refinement
Process or Procedure diagram	comment, input, join, label, optional transition, priority input, process creation, process start, process stop, procedure call, procedure return, procedure reference, procedure start, save, state, synonym, text, text extension, variable,	continuous signal, decision, macro call, output, task, timer	enabling condition, import and export, internal input and output, service, view and reveal
Data type diagram	predefined data	abstract data, ASN.1 type definition	name class literal

The concepts that are not allowed in ETSs are not included in the analysis of interchange possibilities.

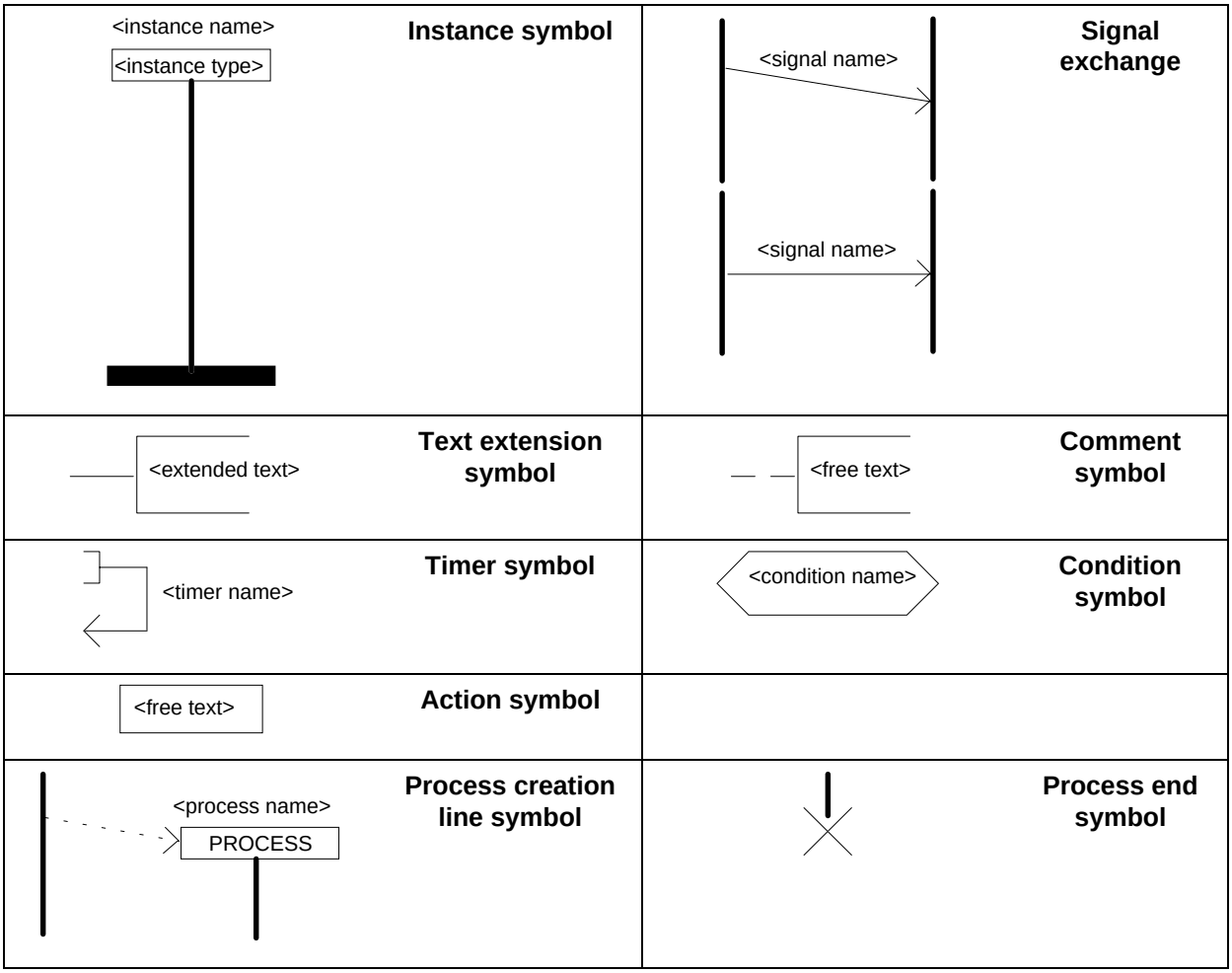
Object oriented extensions in SDL-92 were not considered in ETS 300 414 [1]. In order to reflect the current usage of SDL in ETSI, it is necessary to include SDL-92 extensions in the portability study. An analysis of how SDL-92 is currently being used in ETSI resulted in that the following SDL-92 was included in the study:

Process or Procedure diagram:	spontaneous transition, non deterministic decision (any), remote procedures, any value expression (in assignment statements).
Structural typing concepts:	system type, block type, process type, system definition based on system type, block definition based on block type, process definition based on process type, gate.
Specialization:	adding properties ('normal' inherit and redefinition), virtual type, virtual start transition, virtual transition, virtual save, virtual priority input, virtual spontaneous transition, virtual continuous transition, virtual remote procedure input transition, virtual remote procedure save.

4.3 Selected MSC concepts

ETS 300 414 [1] also regulates the use of MSC concepts. The MSC concepts that can be used in ETSI are shown in table 2.

Table 2: Allowed symbols in MSCs



MSCs are interesting in conjunction with SDL specifications because the two representations of behaviour (SDL and MSCs) should be aligned. Also, MSCs are considered useful in defining use cases during SDL specification development and in relation with validation.

4.4 ASN.1

The ITU-T Recommendation Z.105 [3] describes how ASN.1 can be used in SDL as an alternative to the SDL data type concept. However, since no tool support was available for the combined use of SDL and ASN.1, it was not included in the study.

NOTE: ITU-T Recommendation Z.105 [3] support in some of the selected tools is expected by the time this document is published.

4.5 Common Interchange Format (CIF)

The ITU-T Recommendation Z.106 [5] describes a textual transport format for SDL specifications capable of conveying graphical layout information. Preservation of graphical layout information is important for human readability, but not important for unique interpretation of specifications by tools.

5 Method

5.1 SDL

The format selected for interchange of SDL specifications was SDL/PR. Specifications in PR form should preserve the semantics, but will not preserve any graphical layout information.

The study was based on SDL/PR and contained an analysis of how the tools support the:

- *lexical and syntax rules of ITU-T Recommendation Z.100 [2]*
  The first level of analysis was to investigate if syntactically correct specifications exported from one tool can be imported into another tool without any syntactical errors reported.

- *static semantics*
  Each of the selected SDL tools has a static analysis component. The second level of analysis was to investigate if static semantically correct specifications exported from one tool can be imported into another tool without any static semantic errors reported.

Successful interchange would ultimately mean that the same dynamic behaviour can be reproduced on the different tools using their capabilities for the investigation of dynamic behaviour. Originally, it was planned to include also such dynamic aspects in the study, but not all tools contained support for investigation of dynamic behaviour (e.g. simulators) for SDL-92 descriptions, therefore it was excluded from the study.

5.2 MSC

Currently there are no exchange possibilities for MSCs due to the fact that CIF only covers SDL. Thus, the study was limited to investigating if the tools support the concepts listed in subclause 4.3 of this document.

5.3 Common Interchange Format (CIF)

Since at the start of this study it was not possible to install in ETSI tool versions that support CIF, this part of the study was left for tool vendors to undertake on their own and report the results.

6 The experiments

The main example selected for experimentation was a SDL-92 specification of INAP for CS2. This specification is large enough, formal and covers well the constructs needed in standardization work.

In order to get started the much smaller simple SDL-92 specification related to B-ISDN was also used in experiments.

Another example that was used was a specification of INRES protocol, where only SDL-88 is used.

The study of portability of SDL concepts was conducted in 5 experiments. A report from each of the experiments is included in annexes A-E of the present document. The 5 different experiments were as follows:

1. Exporting a simple SDL-92 specification related to B-ISDN from SDT and importing it into ObjectGEODE.
2. Exporting an SDL-92 specification of INAP for CS2 from SDT and importing it into ObjectGEODE.
3. Exporting an SDL-92 specification of INAP from SDT and importing it back into SDT.
4. Exporting an SDL-88 specification of INRES from SDT and importing it into ObjectGEODE.
5. Exporting SDL-92 specifications of INAP for CS2 from ObjectGEODE and importing it into SDT.

In experiments 1-4 the SDL specifications exported were syntactically and static semantically correct with respect to ITU-T Recommendation Z.100 [2]. In experiment 5, due to tool limitations, the specifications exported were syntactically correct with respect to the tool exporting the specifications and with respect to ITU-T Recommendation Z.100 [2], but incomplete with respect to specification of interconnection of gates with signalroutes or channels.

7 Identified problems

7.1 Portability between ObjectGEODE and SDT

The table 3 below contains the problems identified during the experiments and their initial description. Each problem is given a ranking (High, Medium or Low) which indicates how serious the problem is. A ranking of High means that the problem has serious implications on portability, Low means that the problem does not hamper the portability but some non-SDL information may be lost (for example the structure information in browser tools etc.).

Table 3: Identified portability problems

SDL concept	Rank	Problem description
Syntype definitions	Medium	In SDL it is possible to define data types that are restrictions of another type. For example, it is possible to define a type MyInteger that is a normal Integer type, but restricted to the range 0-10. In SDL this is defined as follows: **syntype** MyInteger = Integer **constants** 0:10 **endsyntype** MyInteger; MyInteger will still be an Integer, for example a Procedure P with a formal parameter A of type Integer can be called with an actual parameter of A of type MyInteger. Assignments of values outside the range of MyInteger will result in a dynamic error. However, in ObjectGEODE syntypes are interpreted as newtype definitions. Therefore, calling the Procedure P as above will result in a static semantic error, i.e. MyInteger is no longer an Integer.

SDL concept	Rank	Problem description
Use of referenced definitions	Low	When PR is generated from SDT, the *referenced definition* concept of SDL is used. This means that for example if a Block definition B contains a Process definition P, the PR generated from SDT will be the following: **block** B; **process** P **referenced**; **endblock** B; **process** P; ... **endprocess** P; ObjectGEODE supports the referenced definition concept, but this leads to one level decomposition of SDL entities. More appropriate is to remove all referenced specifications and move the actual referenced contents in its place. In the example above, this will result in the following: **block** B; **process** P; ... **endprocess** P; **endblock** B; SDT supports both forms of PR, so importing into SDT does not impose any restrictions.
Predefined operators in newtype definitions	Medium	In SDL, equality and nonequality is predefined for newtype definitions. This means that for every newtype definition, = and /= is 'automatically' supported and does not have to be explicitly defined. However, in ObjectGEODE, = and /= has to be explicitly defined for every newtype.

SDL concept	Rank	Problem description
Lexical rules	Medium	Lexical rules of SDL are as follows: control characters are interpreted as space, SDL names can contain underscore character in which case all spaces and control characters including the preceding underscore are ignored. In SDT control characters are treated as follows:. In SDL names a combination of underscore followed by new line control character is supported as required by ITU-T Recommendation Z.100 [2]. More than one control or space character that follow the underscore is not supported. Geode does not support underscore followed by new line control character, and in PR newline is removed but underscore remains. There are other examples that demonstrate that Geodedit (not GeodeCheck) has problems with new line control character between qualifier and a name of an SDL entity.
Existing (dashed) typebased block and process definitions	High	Existing typebased block and process definitions can be created in Geodedit, but they are saved in PR as referenced definitions which is not in accordance with ITU-T Recommendation Z.100 [2]. In addition, gate names at dashed symbols cannot be specified as connection points for channels or signalroutes. Even when this information is received in an imported PR specification, it is systematically removed by Geodedit. GeodeCheck on the other hand accepts it in imported PR files but does not update the signals allowed in gates accordingly with signal added in a redefined process or block type definition.
Visibility and/or qualifiers	High	Virtual process type definitions of the supertype of a redefined block are not visible in ObjectGEODE.
Qualifiers	Medium	ObjectGEODE treats it as an error when a qualifier is placed in front of the name in situation when this is not needed. Since this is allowed by ITU-T Recommendation Z.100 [2] it should not be treated as an error.

7.2 SICAT tool

The analysis of the SICAT tool resulted in the following:

- the tool relies on implementation language data rather than SDL or ASN.1 data;
- the support of SDL-92 is planned but not implemented yet;
- conversion from GR form to PR and from PR to GR is currently not supported by SICAT but it may be supported in new releases;
- support for CIF is being considered.

The conclusion is that standards like INAP or B-ISDN UNI cannot be input into the current version of the SICAT tool. In order to achieve that, support of PR/GR conversion or CIF together with support of ITU-T Recommendation Z.105 [3] is required.

8 Results

8.1 SDL

Problems identified during the experiments were discussed with tool vendors. During this discussion the way to resolve some of the problems was agreed upon, as shown in table 4 below.

Table 4: Resolved portability problems

Problem	Result
Inconsistent handling of 'dashed' symbols.	The next release of ObjectGEODE will handle correctly dashed symbols.
Incorrect scope of virtual process types defined within virtual block types. Inconsistent use of qualifiers.	The next release of ObjectGEODE will handle correctly virtual process types and qualifiers.
Inconsistent and non ITU-T Recommendation Z.100 [2] conforming handling of underscore (_).	The next release of ObjectGEODE will handle underscore in the same way as SDT. Since neither of the tools intend to fully comply with ITU-T Recommendation Z.100 [2] lexical rules, appropriate restrictions in the use of SDL in ETSI should be included in updated ETS 300 414 [1].

The following items are still unresolved:

Problem	Action
Inconsistent and non ITU-T Recommendation Z.100 [2] conforming handling of syntype definitions.	Formal definition of SDL defines that sorts used as in/out parameters of procedure calls have to be identical. The text of ITU-T Recommendation Z.100 [2] is not aligned with that and should be updated. Telelogic will resolve the problem in SDT in future releases of the tool. At the same time, guidelines for the use of SDL in ETSI should address the issue.
Inconsistent and non ITU-T Recommendation Z.100 [2] conforming handling of predefined operators in newtype definitions, turned out to be a problem of overloading of integers with literals	Verilog informed the meeting that predefined operators are handled correctly by ObjectGEODE, but that overloading of integers with literals is not supported. It has been agreed that this limitation is not a serious one. At the same time, guidelines for the use of SDL in ETSI should address the issue.

Also, the SICAT tool cannot input standards that use SDL-92, nor SDL-88 with SDL data.

8.2 MSC

MSC concepts selected in subclause 4.3 are supported by both SDT and ObjectGEODE. Most of the concepts are supported by SICAT tool as well, but some symbols are not supported, such as action symbol, process end symbol, text extension and comment symbols.

8.3 Common Interchange Format (CIF)

Version 3.1 of SDT currently in use by ETSI is supporting CIF. The experiments performed by Verilog did not reveal any discrepancy between the CIF produced by SDT and the ITU-T Recommendation Z.106 [5]. The current version of ObjectGEODE is reported not to fully conform to ITU-T Recommendation Z.106 [5]. The next release of ObjectGEODE should resolve the remaining problems.

9 Conclusions

The general conclusion from the PT86 study, at least with respect to ObjectGEODE and SDT, is that portability of SDL-88 specifications works in practice. Concerning SDL-92 this study has helped the tool manufacturers to resolve some problems, but some specific issues still need to be resolved in the manner identified during this study.

The initiative by MTS to perform the tool study and to provide a forum for discussions on how to improve the 'tool situation' is well appreciated.

It is suggested to MTS to consider portability of SDL specifications as a factor that should influence the planned work on updating of ETS 300 414 [1].

It is recommended that ETSI delivers the formal descriptions in the following manner:

- Portable document format (.pdf) descriptions should be available on ETSI CD-ROM;
- PR, CIF and SDT format should be made available to ETSI members.

It is recommended that once a year a workshop is held to demonstrate the interoperability of different tools for SDL, ASN.1, MSC and TTCN. The first one could demonstrate the portability of SDL documents using CIF. The workshop could be organized by PEX with tool vendor participation and in conjunction with other relevant ETSI event.

Annex A:
Experiment 1

A.1 Description

Importing a simple object-oriented model created with SDT into ObjectGEODE using PR.

A.2 Steps performed

1. Simple, object oriented SDL description created with SDT tool was transformed in PR representation using SDT. The PR code was read with Geodedit.
2. The resulting GR was examined with Geodedit.
3. Geodecheck was used to analyse the SDL description twice:
   a) before .pr file was modified by Geodedit (Error report in appendix A.I);
   b) after a new .pr file was created by Geodedit (Error report in appendix A.II).
4. PR file exported from SDT was rearranged manually on the PR level by replacing references with definitions and removing qualifiers in names and imported into Geode.
5. Geodecheck was used to analyse the SDL description twice:
   a) before a PR file was modified by Geodedit (Error report in appendix A.III);
   b) after a new PR file was created by Geodedit (Error report in appendix A.IV).
6. Error reports were analysed.
7. SDL model used in experiment 2 was manually edited in Geodedit and checked using Geodecheck. (Error report in appendix A.V).

A.3 Observations

1. SDT creates PR representation so that definitions are referenced in the scope unit where they belong and the definition itself is given elsewhere, as shown in a portion of .pr file in figure 1. This is in accordance with ITU-T Recommendation Z.100 [2].

When such a .pr file is read in by Geodedit a hierarchy of descriptions is created which is not incorrect, but does not represent well the structuring of descriptions. Some examples are shown in figure 2.

```
block type NetAppl;
gate NaGate out with (FromNetApplication); in with (ToNetApplication);
signalroute NaR
  from NaPi via NaG to env via NaGate with (FromNetApplication);
  from env via NaGate to NaPi via NaG with (ToNetApplication);
virtual process type NaPt referenced;
process NaPi (1, 1) : NaPt;
endblock type;
virtual process type  <<block type NetAppl>> NaPt;
gate NaG out with (FromNetApplication); in with (ToNetApplication);
start;
    stop;
endprocess type;
```

Figure 1

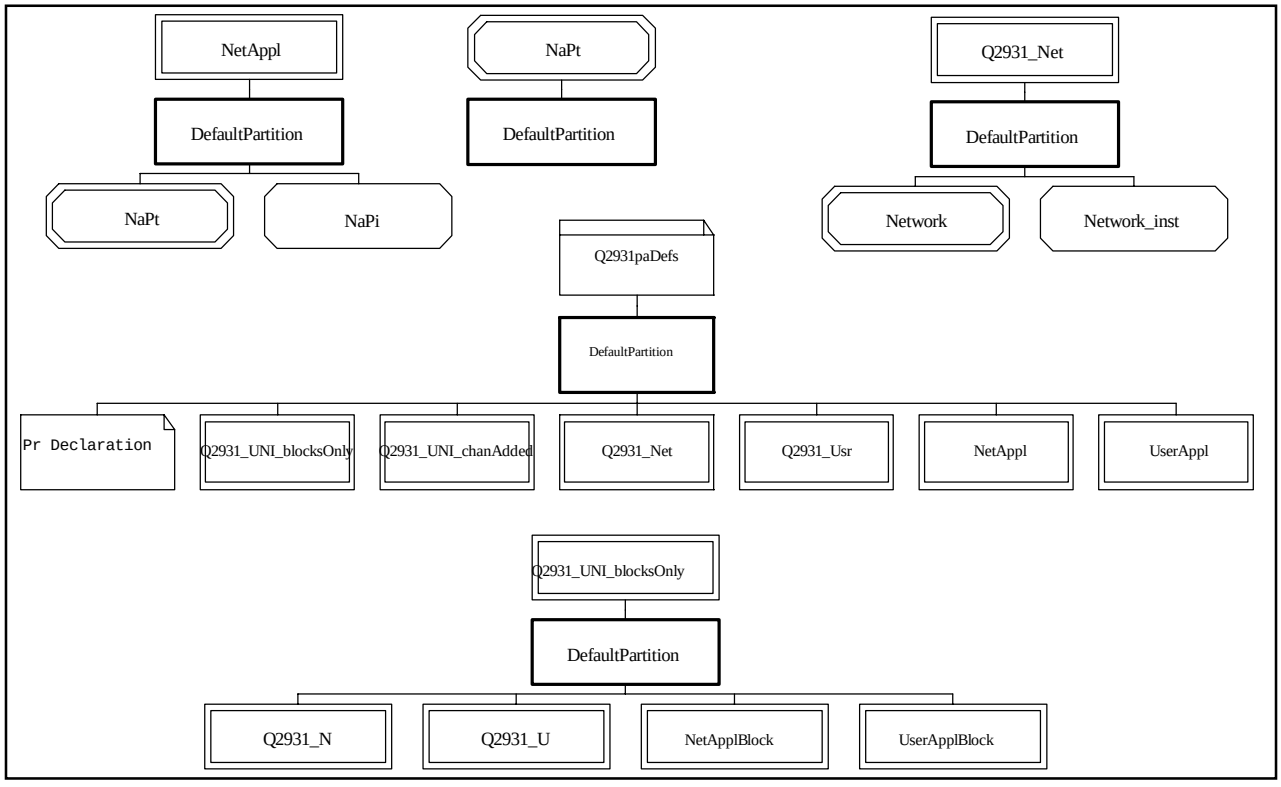


Figure 2

2. Virtual process type diagrams seem to be correctly converted, including gate definitions, both in terms of correct content and graphically well arranged. This is demonstrated by example shown in figure 3.

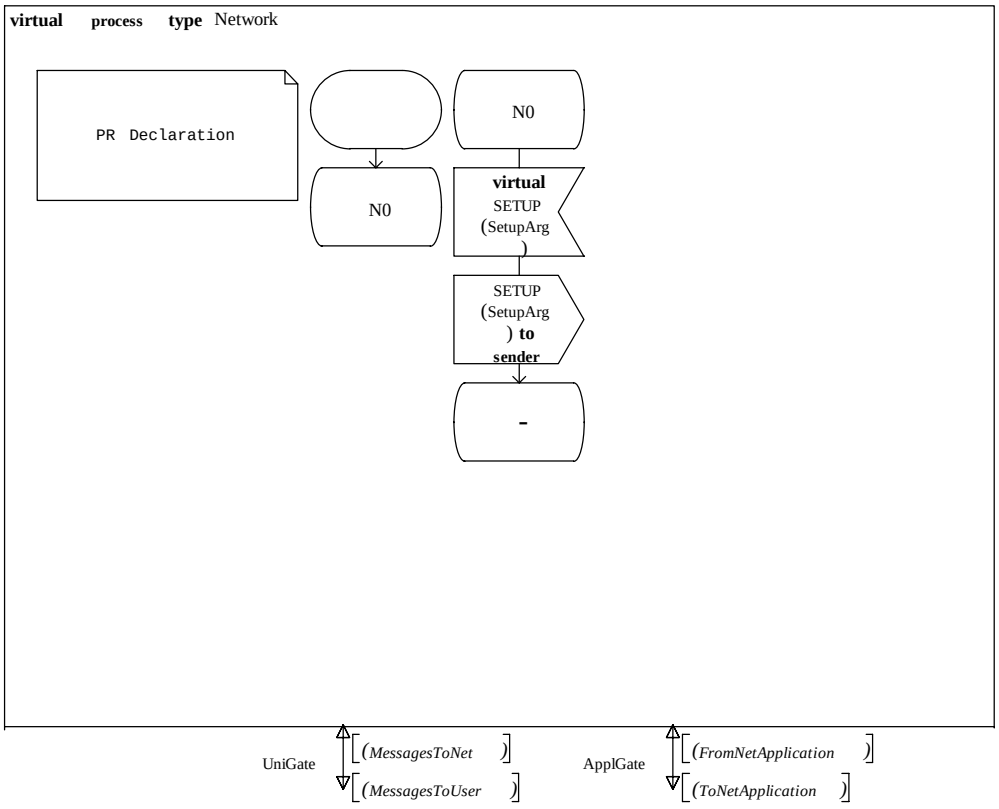


Figure 3

3. Redefined process type diagrams including dashed gate definitions are also well converted as shown in figure 4.

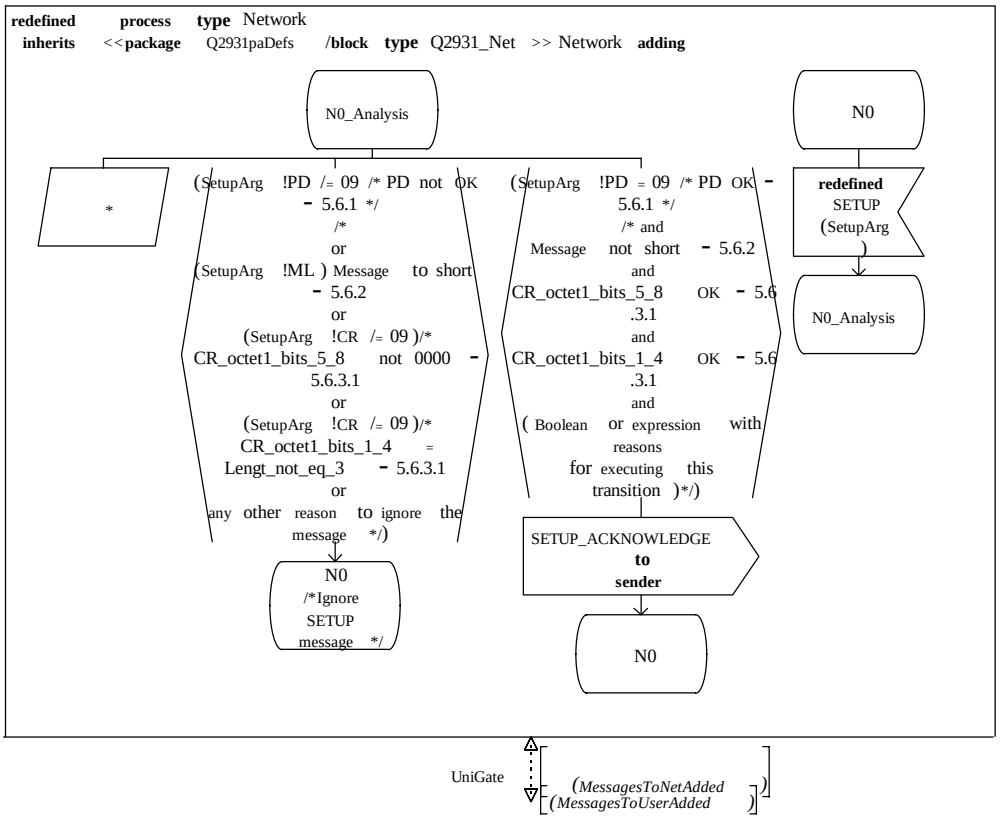


Figure 4

4. Virtual block type definitions are basically converted correctly, but untidy. Example is shown in figure 5.

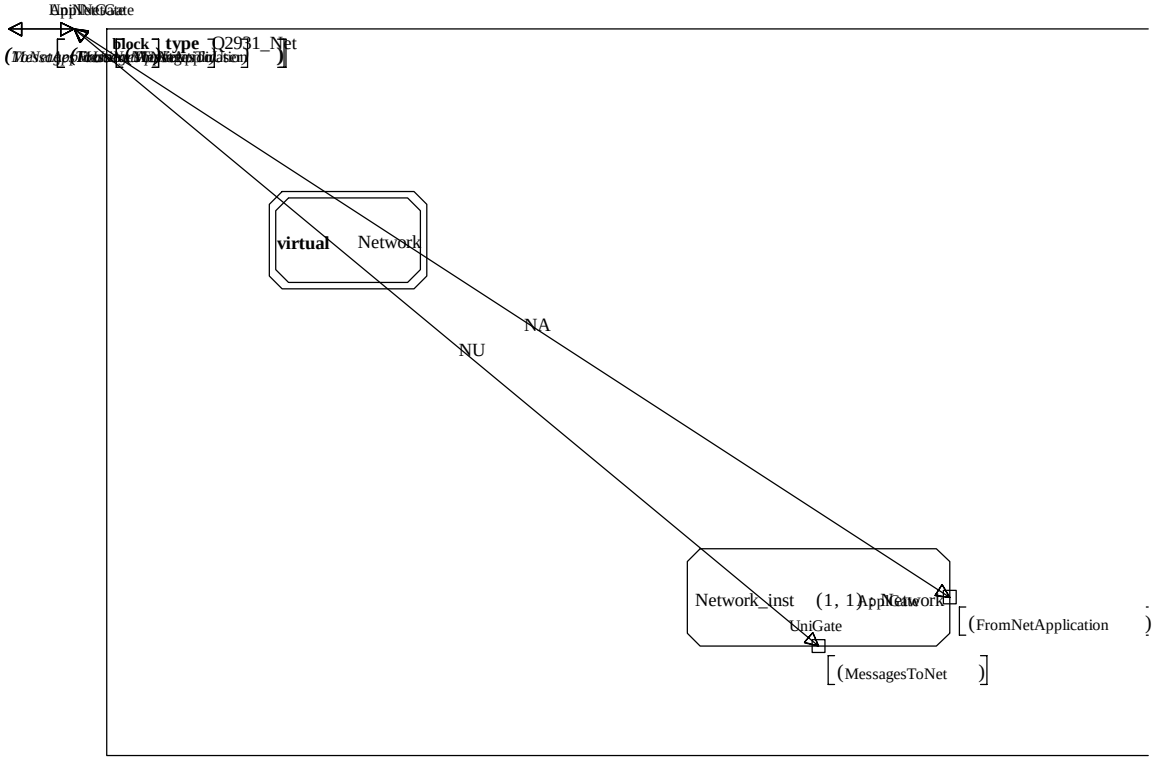


Figure 5

5. Block type definitions that contain dashed process instances (existing typebased process definitions) as well as system definitions that contain dashed block instances (existing typebased block definitions) are not converted well, as shown in figure 6. Dashed symbols (block or process) are not created, gates on their borders are not shown so that channels and signalroutes respectively cannot show their connections to block or system boundary. This problem will be addressed again later on.

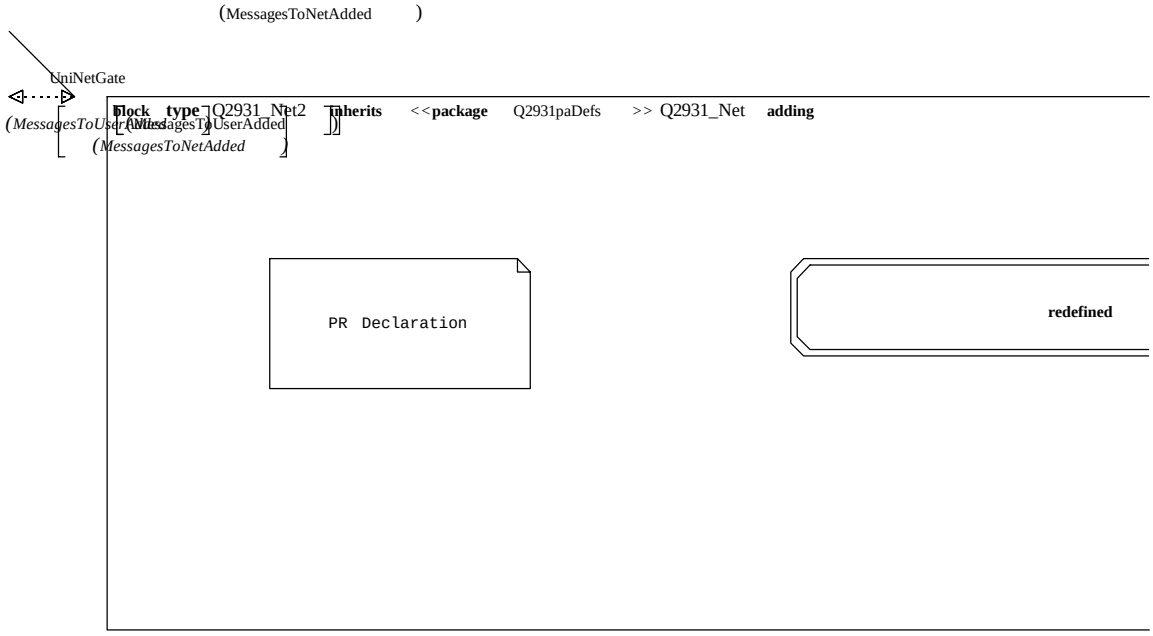


Figure 6

6. Automated placement routines are such that type reference symbols are placed diagonally across the page. This is, of course correct in terms of SDL, but creates large diagrams that need to be edited manually. The use of CIF will remove this problem, at least for tools that will support CIF.

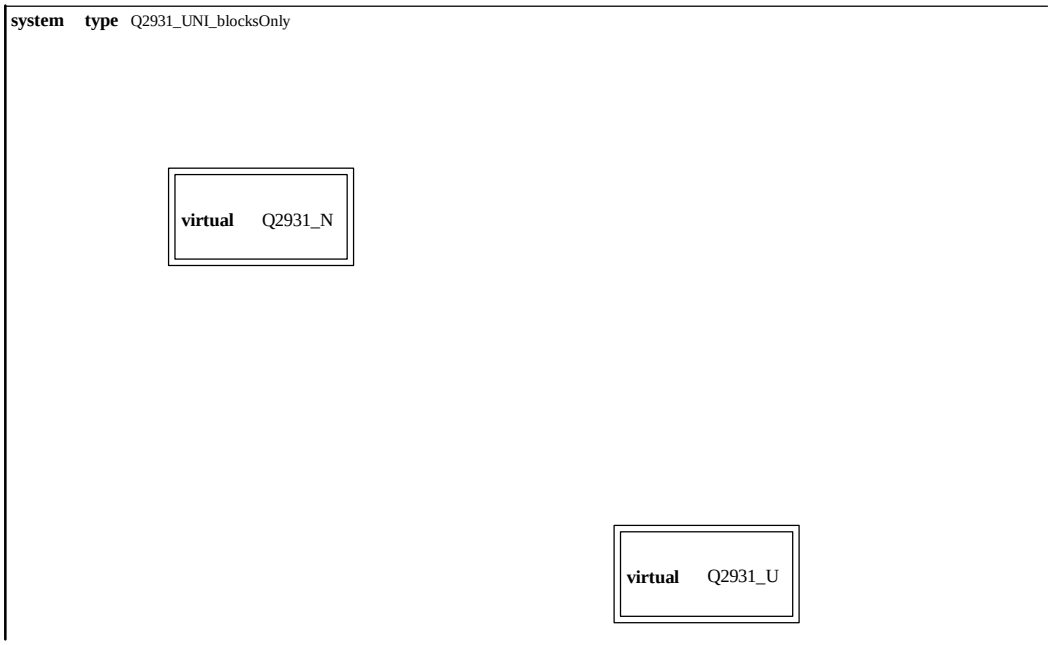


Figure 7

7. Geodecheck was used to analyse the original .pr file and .pr file saved by Geodedit (without any editing action). Since the two reports are different, analysis was made to discover the cause for the difference. The main difference that was discovered was that all references to gates to which the channels or signalroutes were connected (using VIA construct in channel or signalroute definitions are systematically removed when Geodedit saves the new version of a .pr file. A part of the original .pr file is shown in figure 8. and the same part is shown after it was saved by Geodedit in figure 9 (CIF parts are deleted). The parts that are removed are bolded in figure 8.

```
block type Q2931_Net2 inherits  <<package Q2931paDefs>> Q2931_Net adding;

gate UniNetGate adding out with (MessagesToUserAdded);

in with (MessagesToNetAdded);

signalroute NU2

  from env via UniNetGate to Network_inst via UniGate with (MessagesToNetAdded);

  from Network_inst via UniGate to env via UniNetGate

    with (MessagesToUserAdded);

/*#DASHED PROCESS Network_inst*/
```

Figure 8

```
BLOCK TYPE Q2931_Net2 inherits  <<package Q2931paDefs>> Q2931_Net adding;

GATE UniNetGate ADDING

   IN WITH (MessagesToNetAdded);

   OUT WITH (MessagesToUserAdded);

SIGNALROUTE NU2

   FROM ENV VIA UniNetGate TO Network_inst WITH (MessagesToNetAdded);

   FROM Network_inst TO ENV VIA UniNetGate WITH (MessagesToUserAdded);
```

Figure 9

8. Error report resulting from original file analysis indicates that gate redefinitions are not dealt with properly, i.e. signals added to the redefined gates are not recognized. If VIA gatename is omitted from channel or signalroute definitions such problems are not reported.

9. When step 4 has been performed (manual rearrangement of description in PR), hierarchy was better represented as shown in figure 10. What is still missing are existing (dashed) block and process typebased definitions. They are not represented neither in hierarchy diagrams nor in appropriate system and block type diagrams.

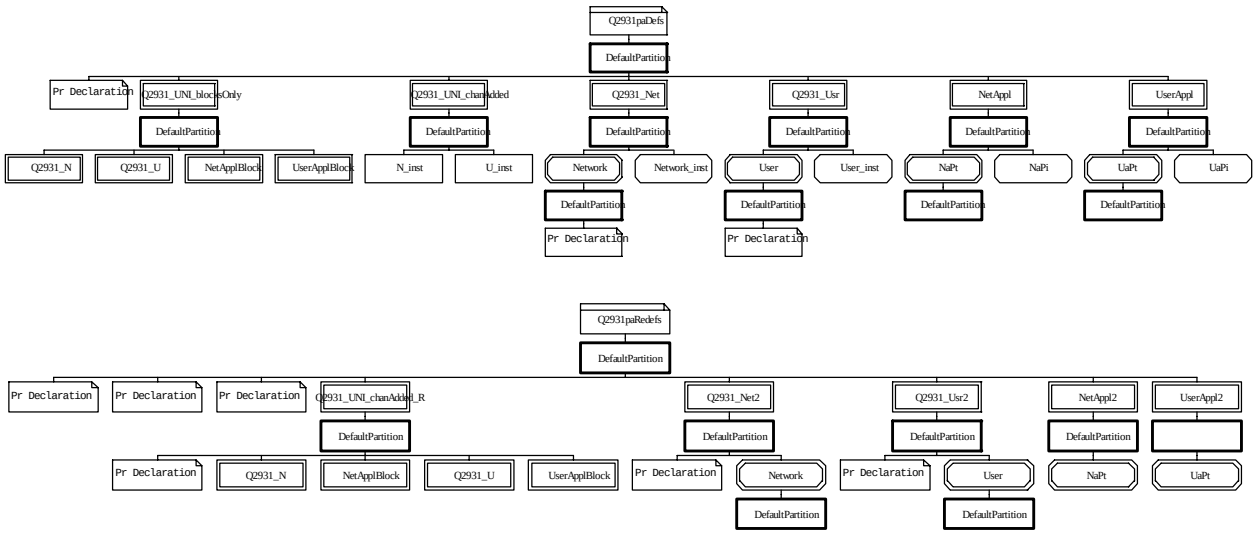


Figure 10

10. Redefined block types can be seen in the editor, but cannot be printed. Some redefined process types are also visible but cannot be printed.

11. The same problems with existing (dashed) block and process typebased definitions as described before persisted.

12. Changed diagrams are shown in figure 11, 12 and 13. Added are existing (dashed) typebased block and process definitions. Geodedit does not allow the user to create a gate symbol on existing (dashed) block and process typebased definitions.

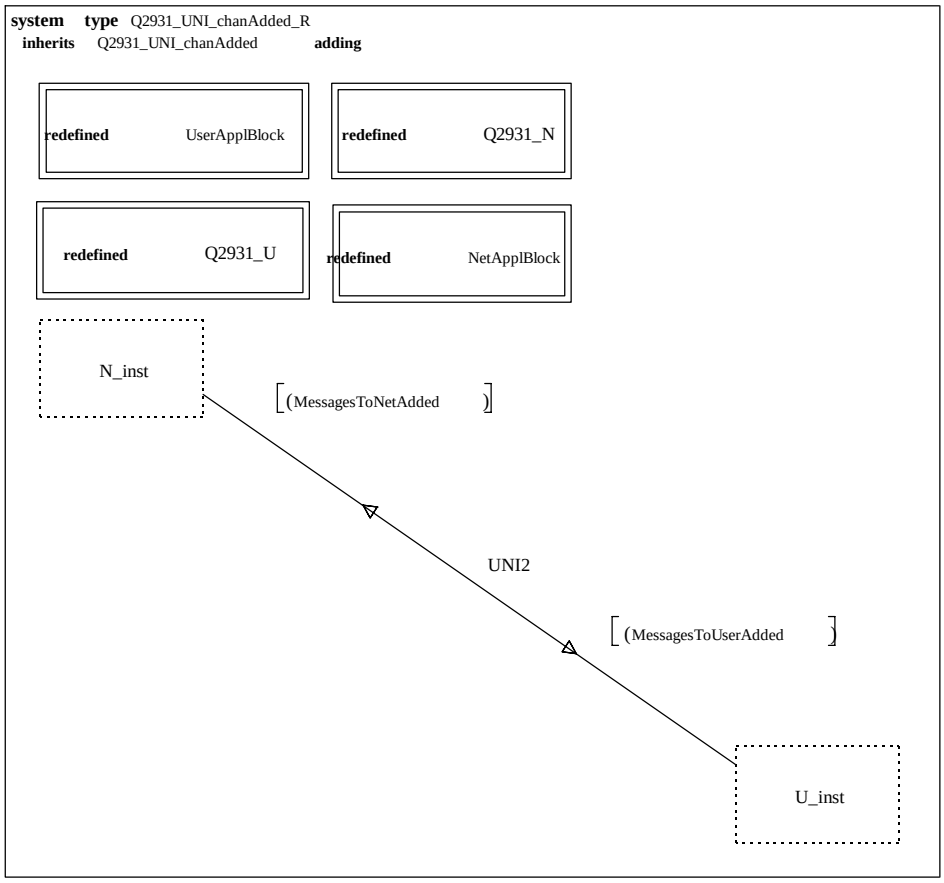


Figure 11

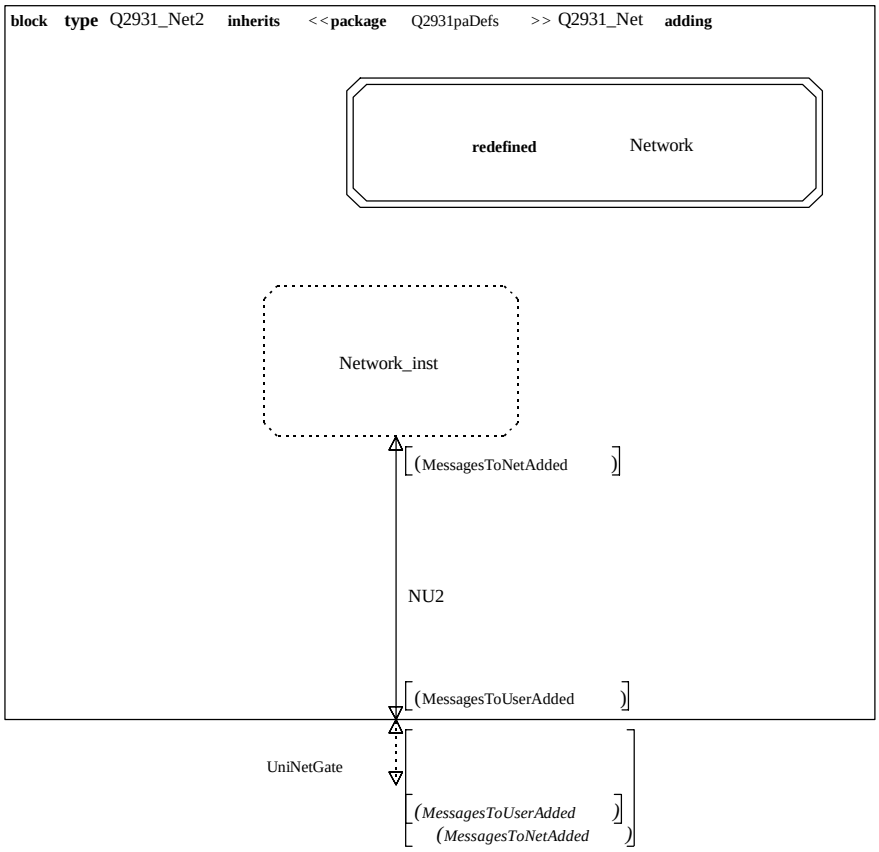


Figure 12

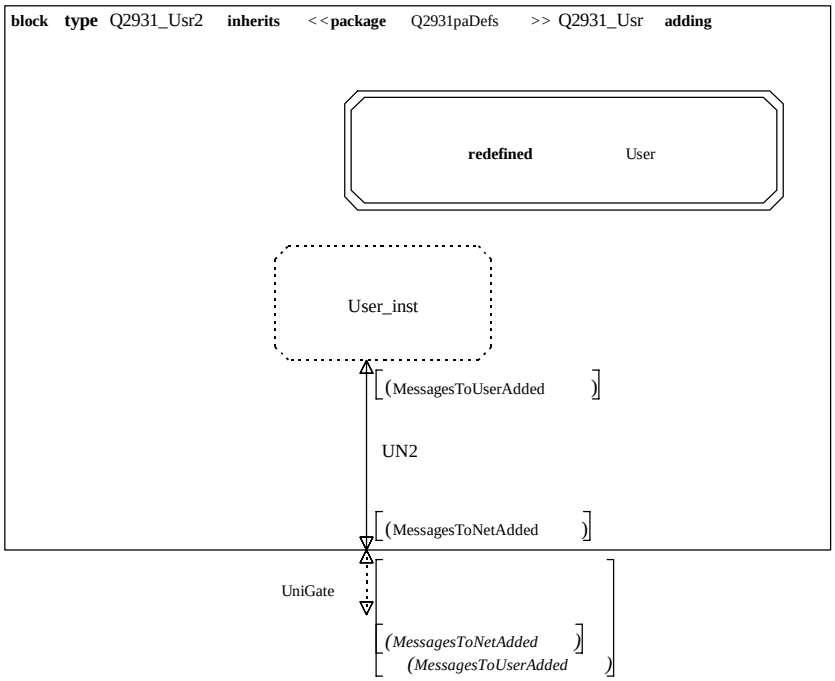


Figure 13

Errors reported indicate that existing (dashed) typebased block and process definitions are not handled properly. It appears that both Geodecheck and Geodedit have problems with these constructs.

It was found out that Geodedit saves existing (dashed) block and process typebased definitions in .pr as referenced block or process definitions (for example BLOCK block_name REFERENCED;), which is not in accordance with ITU-T Recommendation Z.100 [2]. This may be the reason why conversion from .pr does not work correctly.

A.4 Conclusions

1. There are some serious problems in achieving practical portability of SDL documents:
   - support for existing (dashed) block and process typebased definitions;
   - support for gates at such existing (dashed) block and process typebased definitions;
   - correct PR representation of existing (dashed) block and process typebased definitions;
   - the need to manually rearrange .pr files due to lack of support for referencing mechanism of SDL/PR.
2. Graphical untidiness which was demonstrated in some cases is considered to be of lesser importance which will be resolved by use of CIF.

Appendix A.I

Error report for simple SDL description exported from SDT and imported into Geode without any changes

Report is sorted so that errors are shown first.

(16 information)

14 warnings

8 errors

error [12.22] line 727: Signal setup_acknowledge no referenced in gate unigate signalist

error [12.22] line 727: Signal setup_acknowledge no referenced in gate unigate signalist

error [12.22] line 779: Signal setup_acknowledge no referenced in gate unigate signalist

error [12.22] line 779: Signal setup_acknowledge no referenced in gate unigate signalist

error [12.22] line 809: Signal setup_acknowledge no referenced in gate uniusergate signalist

error [12.22] line 809: Signal setup_acknowledge no referenced in gate uninetgate signalist

error [12.22] line 809: Signal setup_acknowledge no referenced in gate uninetgate signalist

error [12.22] line 809: Signal setup_acknowledge no referenced in gate uniusergate signalist

warning [0.1.11] line 749: "/*" in informal comment

warning [0.1.11] line 751: "/*" in informal comment

warning [12.58.b] line 755: Multiple transition, STATE n0_analysis continuous signal with same (or without) priority

warning [2.1.1] line 790: Signal identifiers in signal list are not distinct: setup appears twice

warning [2.1.1] line 790: Signal identifiers in signal list are not distinct: setup appears twice

warning [4.1.11] line 199: Redeclaration of SORT setupargtype

warning [4.1.11] line 713: Redeclaration of PROCESS TYPE napt

warning [4.1.11] line 732: Redeclaration of PROCESS TYPE network

warning [4.1.11] line 783: Redeclaration of PROCESS TYPE user

warning [4.1.11] line 796: Redeclaration of PROCESS TYPE uapt

warning [4.1.11] line 815: Redeclaration of BLOCK TYPE q2931_n

warning [4.1.11] line 816: Redeclaration of BLOCK TYPE netapplblock

warning [4.1.11] line 817: Redeclaration of BLOCK TYPE q2931_u

warning [4.1.11] line 818: Redeclaration of BLOCK TYPE userapplblock

Appendix A.II

Error report for simple SDL description exported from SDT, imported into Geode without any changes after Geodedit saved the description in its format, without any meaningful changes to the contents.

"newprt.pr", warning [0.1.11] line 1426: "/*" in informal comment

"newprt.pr", warning [0.1.11] line 1428: "/*" in informal comment

"newprt.pr", warning [4.1.11] line 95: Redeclaration of SORT setupargtype

"newprt.pr", warning [12.58.b] line 1437: Multiple transition, STATE n0_analysis continuous signal with same (or without) priority

"newprt.pr", warning [2.1.1] line 1489: Signal identifiers in signal list are not distinct: setup appears twice

"newprt.pr", warning [2.1.1] line 1489: Signal identifiers in signal list are not distinct: setup appears twice

"newprt.pr", (16 information)

"newprt.pr", 6 warnings

"newprt.pr", 0 error

Appendix A.III

Error report for simple SDL description exported from SDT rearranged manually by replacing references with definitions and removing qualifiers in names and imported into Geode.

Report is sorted to show the errors first.

(26 information)

6 warnings

8 errors

error [12.22] line 143: Signal setup_acknowledge no referenced in gate uniusergate signalist

error [12.22] line 143: Signal setup_acknowledge no referenced in gate uninetgate signalist

error [12.22] line 143: Signal setup_acknowledge no referenced in gate uninetgate signalist

error [12.22] line 143: Signal setup_acknowledge no referenced in gate uniusergate signalist

error [12.22] line 167: Signal setup_acknowledge no referenced in gate unigate signalist

error [12.22] line 167: Signal setup_acknowledge no referenced in gate unigate signalist

error [12.22] line 211: Signal setup_acknowledge no referenced in gate unigate signalist

error [12.22] line 211: Signal setup_acknowledge no referenced in gate unigate signalist

warning [0.1.11] line 184: "/*" in informal comment

warning [0.1.11] line 186: "/*" in informal comment

warning [12.58.b] line 190: Multiple transition, STATE n0_analysis continuous signal with same (or without) priority

warning [2.1.1] line 217: Signal identifiers in signal list are not distinct: setup appears twice

warning [2.1.1] line 217: Signal identifiers in signal list are not distinct: setup appears twice

warning [4.1.11] line 232: Redeclaration of SORT setupargtype

Appendix A.IV

Error report for simple SDL description exported from SDT rearranged manually by replacing references with definitions and removing qualifiers in names and imported into Geode.

Error report generated by Geodecheck after Geodedit saved the description in its format, without any meaningful changes to the contents.

Report is sorted to show the errors first.

(26 information)

0 error

6 warnings

warning [0.1.11] line 1241: "/*" in informal comment

warning [0.1.11] line 1243: "/*" in informal comment

warning [12.58.b] line 1252: Multiple transition, STATE n0_analysis continuous signal with same (or without) priority

warning [2.1.1] line 1349: Signal identifiers in signal list are not distinct: setup appears twice

warning [2.1.1] line 1349: Signal identifiers in signal list are not distinct: setup appears twice

warning [4.1.11] line 583: Redeclaration of SORT setupargtype

Appendix A.V

SDL model imported into Geode was manually edited so that existing (dashed) tybased block and process definitions are added where needed.

(27 information)

10 warnings

5 errors

error [1.2] line 1197: Block u_inst must contain either one or more processes or a substructure definition (2.4.3)

error [1.2] line 1201: Block n_inst must contain either one or more processes or a substructure definition (2.4.3)

error [2.3.7] line 1146: No connection in n_inst for signal route or channel uni2

error [2.3.7] line 1146: No connection in u_inst for signal route or channel uni2

error [6.2] line 1387: GATE unigate undefined

warning [0.1.11] line 1298: "/*" in informal comment

warning [0.1.11] line 1302: "/*" in informal comment

warning [0.2.9] line 1197: No referenced definition for u_inst, ignored

warning [0.2.9] line 1201: No referenced definition for n_inst, ignored

warning [0.2.9] line 1367: No referenced definition for network_inst, ignored

warning [0.2.9] line 1450: No referenced definition for user_inst, ignored

warning [12.58.b] line 1316: Multiple transition, STATE n0_analysis continuous signal with same (or without) priority

warning [2.1.1] line 1433: Signal identifiers in signal list are not distinct: setup appears twice

warning [2.1.1] line 1433: Signal identifiers in signal list are not distinct: setup appears twice

warning [4.1.11] line 617: Redeclaration of SORT setupargtype

Annex B:
Experiment 2

B.1 Description

Importing an complex object-oriented model for INAP created with SDT tool into ObjectGEODE using a PR representation was investigated.

B.2 Steps performed

1. Original inap.pr was read in Geodedit and analysed with GeodeCheck. Resulting error report is given in appendix B.I.
2. Geodecheck analysis from step 1 was repeated after the save by Geodedit. Resulting error report is given in appendix B.II.
3. Original inap.pr was manually edited so that references to definitions are replaced with definitions, read in Geodedit and analysed with GeodeCheck. Resulting error report is given in appendix B.III.
4. File from step 3 was manually edited so that qualifiers are removed. Resulting error report is given in appendix B.IV.
5. Geodecheck analysis from step 4 was repeated after the save by Geodedit. Resulting error report is given in appendix B.V.
6. Step 5 was repeated with some necessary changes to inap.pr file. Resulting error report is given in appendix B.VI.

7. Error reports are analysed using .pr files and cross reference files. The analysis begun with classification of reported errors as shown in table B.1.

Table B.1

No.	Appendix B.I	Appendix B.II	Appendix B.III	Appendix B.IV	Appendix B.V	Appendix B.VI	Error message
1	1-38		1-38	1-38			Signal *signalname* no referenced in gate *gatename* signallist
2	44, 45	6,7	72, 73	44, 45		6, 7	Same sort *sortname* must be specified for formal and actual IN/OUT parameter
3	39-43	1-5	67-71	39-43		1-5	Created process *processname* must be defined in the same block
4	46-51	8-13	74-79	46-51		8-13	Invalid qualifier: identifier *identifier* is not visible
5			39 - 66				Qualifier in definition ignored
6					Whole report		New definition without virtuality transmission, Transition with invalid virtuality, etc.
7						14-73	Signal identifiers in signal list are not distinct
8						74-169	Redeclaration of variable, parameter or synonym *name*

8. Graphical outlook was examined in Geodedit.

B.3 Observations

First observations will be numbered with same numbers as rows in table B.1 where errors reported are classified. Observation 9 compares error reports in annexes 2 and 6. Observation 10 will deal with graphical aspects.

1. Channels and signalroutes use the "VIA *gatename*" construct. The signals added in redefined blocks and processes are not taken into account. Geodedit systematically removes VIA *gatename* construct when saving, and the fact is that there are no such errors reported after save operation. On the other hand this leads to loss of information about the way channels and signalroutes are connected to gates.

2. Procedure formal parameter is defined as Integer. Actual parameter is a syntype of Natural, which in turn is a syntype of Integer. This is in accordance with ITU-T Recommendation Z.100 [2] and should not be reported as an error (it could be a warning).

3. Create command is used in a redefined process of the redefined block. This is wrong diagnostics since existing typebased process definition can be seen in the redefined block.

4. Virtual process types are defined within a virtual block type of a system type definition. Another system inherits and redefines the block type, where in turn processes are redefined. While the qualifier in redefined block definition is accepted, it is reported that virtual process type definitions are not visible so that redefined process type definitions cannot inherit from them. Several ITU-T Recommendation Z.100 [2] compliant correct forms of qualifiers were tried out, but none of them gave result, which is evident from error reports and from cross reference files.

   In another example used in previous experiments, redefined process could inherit from its virtual supertype. The difference was that the block containing redefined process type inherited from another containing a virtual process type, but they were both defined at the package level and had different names.

5. Entities defined in context do not need a qualifier in front of their names, but ITU-T Recommendation Z.100 [2] allows it. Thus, this should not be reported as an error, specially if the qualifier is matching the scope unit.

6. PR file that was input to Geodedit contained process type headers where process name was in the line following REDEFINED PROCESS TYPE text. This did not cause any additional problems when such a file was analysed. But when saving this file, Geodedit converted such process types into newly defined process types with no links to its virtual supertypes. This created very many error reports that were not analysed in detail.

7. It is probably good to issue warnings in such situations as long as it is clear that according to ITU-T Recommendation Z.100 [2] this is not an error.

8. All of these warnings are the result of using the same name for variable of a process and as formal parameters or return variables of procedures defined within the same process type definition. It is probably good to issue warnings in spite of this not being an error.

9. Error reports in annexes 2 and 6 are, apart from line numbering equal. This means that the meaning of the model is conveyed in both cases equally. The difference is that, if input PR representation is not rearranged, the overall structure is not shown to the user but has to be derived from partial structure decompositions.

10. Graphically it could be said that process and procedure diagrams are well converted. On the other hand, system and block type diagrams suffer from many problems, starting from graphical untidiness of supertypes and ending with worse situation in specialized types, where in particular existing (dashed) typebased definitions and their communication paths could not be converted properly.

B.4 Conclusions

1. This experiment confirmed that there are still some serious problems in achieving practical portability of SDL documents:

   - support for existing (dashed) block and process typebased definitions;
   - support for gates at such existing (dashed) block and process typebased definitions;
   - correct PR representation of existing (dashed) block and process typebased definitions;
   - the need to manually rearrange .pr files due to lack of support for referencing mechanism of SDL/PR.

2. Problems with visibility of supertypes from the context where subtypes are defined appeared in this example. Models based on object-orientation cannot be successfully ported unless this is resolved.

3. Newtypes and syntypes should be treated in accordance with ITU-T Recommendation Z.100 [2]. The same goes for the use of qualifiers.

4. Graphical untidiness which was demonstrated in some cases is considered to be of lesser importance which will be resolved by use of CIF.

5. There are problems with respect of lexical rules of ITU-T Recommendation Z.100 [2].

Appendix B.I

Error report for inap SDL description exported from SDT and imported into Geode without any changes.

SDL Editor V3.0.0a geodecheck (c) VERILOG 1988 1996

Report is sorted so that error is shown first.

51 errors

169 warnings

(279 information)

1. error [12.22] line 6100: Signal continuecsprim no referenced in gate scf signalist
2. error [12.22] line 6100: Signal reportutsiprim no referenced in gate scf signalist
3. error [12.22] line 6104: Signal networksuspendreqind no referenced in gate ibi signalist
4. error [12.22] line 6104: Signal networksuspendreqind no referenced in gate ibi signalist
5. error [12.22] line 6104: Signal networksuspendreqind no referenced in gate ibi signalist
6. error [12.22] line 6104: Signal networksuspendreqind no referenced in gate ibi signalist
7. error [12.22] line 6108: Signal networksuspendind no referenced in gate sigcon signalist
8. error [12.22] line 6108: Signal networksuspendreq no referenced in gate sigcon signalist
9. error [12.22] line 6112: Signal networksuspendind no referenced in gate sigcon signalist
10. error [12.22] line 6112: Signal networksuspendreq no referenced in gate sigcon signalist
11. error [12.22] line 6116: Signal continuecsprim no referenced in gate scf signalist
12. error [12.22] line 6116: Signal reportutsiprim no referenced in gate scf signalist
13. error [12.22] line 6231: Signal continuecsprim no referenced in gate scf signalist
14. error [12.22] line 6231: Signal reportutsiprim no referenced in gate scf signalist
15. error [12.22] line 6234: Signal networksuspendind no referenced in gate sigcon signalist
16. error [12.22] line 6234: Signal networksuspendreq no referenced in gate sigcon signalist
17. error [12.22] line 6237: Signal networksuspendreqind no referenced in gate ibi signalist
18. error [12.22] line 6237: Signal networksuspendreqind no referenced in gate ibi signalist
19. error [12.22] line 6240: Signal continuecs no referenced in gate csa signalist
20. error [12.22] line 6240: Signal continuecs no referenced in gate ih signalist
21. error [12.22] line 6240: Signal reportutsi no referenced in gate ih signalist
22. error [12.22] line 6240: Signal reportutsi no referenced in gate csa signalist
23. error [12.22] line 6243: Signal continuecs no referenced in gate cs signalist
24. error [12.22] line 6243: Signal continuecs no referenced in gate csa signalist

25. error [12.22] line 6243: Signal reportutsi no referenced in gate csa signalist
26. error [12.22] line 6243: Signal reportutsi no referenced in gate cs signalist
27. error [12.22] line 6246: Signal networksuspendind no referenced in gate t signalist
28. error [12.22] line 6246: Signal networksuspendind no referenced in gate cs signalist
29. error [12.22] line 6246: Signal networksuspendreqind no referenced in gate cs signalist
30. error [12.22] line 6246: Signal networksuspendreqind no referenced in gate t signalist
31. error [12.22] line 6249: Signal continuecs no referenced in gate ssf signalist
32. error [12.22] line 6249: Signal continuecs no referenced in gate cs signalist
33. error [12.22] line 6249: Signal reportutsi no referenced in gate cs signalist
34. error [12.22] line 6249: Signal reportutsi no referenced in gate ssf signalist
35. error [12.22] line 6252: Signal networksuspendreq no referenced in gate cs signalist
36. error [12.22] line 6252: Signal networksuspendreq no referenced in gate o signalist
37. error [12.22] line 6252: Signal networksuspendreqind no referenced in gate o signalist
38. error [12.22] line 6252: Signal networksuspendreqind no referenced in gate cs signalist
39. error [3.3.3] line 6445: Created process o_bcsm must be defined in the same block
40. error [3.3.3] line 6456: Created process o_bcsm must be defined in the same block
41. error [3.3.3] line 6488: Created process o_bcsm must be defined in the same block
42. error [3.3.3] line 6618: Created process o_bcsm must be defined in the same block
43. error [3.3.3] line 6639: Created process o_bcsm must be defined in the same block
44. error [3.3.6] line 5134: Same sort integer must be specified for formal and actual IN/OUT parameter
45. error [3.3.6] line 5639: Same sort integer must be specified for formal and actual IN/OUT parameter
46. error [6.5] line 6347: Invalid qualifier: identifier callsegment is not visible
47. error [6.5] line 7080: Invalid qualifier: identifier callsegmentassociation is not visible
48. error [6.5] line 7617: Invalid qualifier: identifier interfacehandler is not visible
49. error [6.5] line 7752: Invalid qualifier: identifier originatingbcsm is not visible
50. error [6.5] line 8193: Invalid qualifier: identifier ssf_fsm is not visible
51. error [6.5] line 8680: Invalid qualifier: identifier terminatingbcsm is not visible

Appendix B.II

Error report for inap SDL description exported from SDT and imported into Geode without any changes.

Ckeck was performed after Geodedit saved the new version of the .pr file

SDL Editor V3.0.0a geodecheck (c) VERILOG 1988 1996

Report is sorted so that errors are shown first.

13 errors

156 warnings

(279 information)

1. error [3.3.3] line 11801: Created process o_bcsm must be defined in the same block
2. error [3.3.3] line 11835: Created process o_bcsm must be defined in the same block
3. error [3.3.3] line 11923: Created process o_bcsm must be defined in the same block
4. error [3.3.3] line 12260: Created process o_bcsm must be defined in the same block
5. error [3.3.3] line 12324: Created process o_bcsm must be defined in the same block
6. error [3.3.6] line 18779: Same sort integer must be specified for formal and actual IN/OUT parameter
7. error [3.3.6] line 19956: Same sort integer must be specified for formal and actual IN/OUT parameter
8. error [6.5] line 11587: Invalid qualifier: identifier callsegment is not visible
9. error [6.5] line 12942: Invalid qualifier: identifier callsegmentassociation is not visible
10. error [6.5] line 13994: Invalid qualifier: identifier interfacehandler is not visible
11. error [6.5] line 14392: Invalid qualifier: identifier originatingbcsm is not visible
12. error [6.5] line 15425: Invalid qualifier: identifier ssf_fsm is not visible
13. error [6.5] line 16189: Invalid qualifier: identifier terminatingbcsm is not visible
14. warning [2.1.1] line 1002: Signal identifiers in signal list are not distinct: releasereqind appears twice
15. warning [2.1.1] line 1002: Signal identifiers in signal list are not distinct: releasereqind appears twice
16. warning [2.1.1] line 11602: Signal identifiers in signal list are not distinct: releasereqind appears twice
17. warning [2.1.1] line 11602: Signal identifiers in signal list are not distinct: releasereqind appears twice
18. warning [2.1.1] line 11613: Signal identifiers in signal list are not distinct: picresume appears twice
19. warning [2.1.1] line 11613: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
20. warning [2.1.1] line 1173: Signal identifiers in signal list are not distinct: releasereqind appears twice
21. warning [2.1.1] line 1174: Signal identifiers in signal list are not distinct: releasereqind appears twice
22. warning [2.1.1] line 1175: Signal identifiers in signal list are not distinct: releasereqind appears twice
23. warning [2.1.1] line 1176: Signal identifiers in signal list are not distinct: releasereqind appears twice
24. warning [2.1.1] line 1195: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
25. warning [2.1.1] line 1195: Signal identifiers in signal list are not distinct: releasereq appears twice
26. warning [2.1.1] line 1217: Signal identifiers in signal list are not distinct: picresume appears twice
27. warning [2.1.1] line 1217: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
28. warning [2.1.1] line 1250: Signal identifiers in signal list are not distinct: releasereqind appears twice
29. warning [2.1.1] line 1250: Signal identifiers in signal list are not distinct: releasereqind appears twice
30. warning [2.1.1] line 1261: Signal identifiers in signal list are not distinct: releasereqind appears twice
31. warning [2.1.1] line 1261: Signal identifiers in signal list are not distinct: releasereqind appears twice
32. warning [2.1.1] line 1272: Signal identifiers in signal list are not distinct: releasereqind appears twice

33. warning [2.1.1] line 1272: Signal identifiers in signal list are not distinct: releasereqind appears twice
34. warning [2.1.1] line 12958: Signal identifiers in signal list are not distinct: releasereqind appears twice
35. warning [2.1.1] line 12958: Signal identifiers in signal list are not distinct: releasereqind appears twice
36. warning [2.1.1] line 12969: Signal identifiers in signal list are not distinct: releasereqind appears twice
37. warning [2.1.1] line 12969: Signal identifiers in signal list are not distinct: releasereqind appears twice
38. warning [2.1.1] line 1358: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
39. warning [2.1.1] line 1358: Signal identifiers in signal list are not distinct: releasereq appears twice
40. warning [2.1.1] line 1369: Signal identifiers in signal list are not distinct: releasereqind appears twice
41. warning [2.1.1] line 1369: Signal identifiers in signal list are not distinct: releasereqind appears twice
42. warning [2.1.1] line 14021: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
43. warning [2.1.1] line 14021: Signal identifiers in signal list are not distinct: releasereq appears twice
44. warning [2.1.1] line 14032: Signal identifiers in signal list are not distinct: releasereqind appears twice
45. warning [2.1.1] line 14032: Signal identifiers in signal list are not distinct: releasereqind appears twice
46. warning [2.1.1] line 14043: Signal identifiers in signal list are not distinct: releasereqind appears twice
47. warning [2.1.1] line 14043: Signal identifiers in signal list are not distinct: releasereqind appears twice
48. warning [2.1.1] line 15440: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
49. warning [2.1.1] line 15440: Signal identifiers in signal list are not distinct: picresume appears twice
50. warning [2.1.1] line 1609: Signal identifiers in signal list are not distinct: releasereqind appears twice
51. warning [2.1.1] line 1609: Signal identifiers in signal list are not distinct: releasereqind appears twice
52. warning [2.1.1] line 1620: Signal identifiers in signal list are not distinct: picresume appears twice
53. warning [2.1.1] line 1620: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
54. warning [2.1.1] line 3694: Signal identifiers in signal list are not distinct: releasereqind appears twice
55. warning [2.1.1] line 3694: Signal identifiers in signal list are not distinct: releasereqind appears twice
56. warning [2.1.1] line 3705: Signal identifiers in signal list are not distinct: releasereqind appears twice
57. warning [2.1.1] line 3705: Signal identifiers in signal list are not distinct: releasereqind appears twice
58. warning [2.1.1] line 5273: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
59. warning [2.1.1] line 5273: Signal identifiers in signal list are not distinct: releasereq appears twice
60. warning [2.1.1] line 5284: Signal identifiers in signal list are not distinct: releasereqind appears twice
61. warning [2.1.1] line 5284: Signal identifiers in signal list are not distinct: releasereqind appears twice
62. warning [2.1.1] line 5295: Signal identifiers in signal list are not distinct: releasereqind appears twice
63. warning [2.1.1] line 5295: Signal identifiers in signal list are not distinct: releasereqind appears twice
64. warning [2.1.1] line 698: Signal identifiers in signal list are not distinct: releasereqind appears twice
65. warning [2.1.1] line 698: Signal identifiers in signal list are not distinct: releasereqind appears twice
66. warning [2.1.1] line 722: Signal identifiers in signal list are not distinct: releasereq appears twice

67. warning [2.1.1] line 722: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
68. warning [2.1.1] line 734: Signal identifiers in signal list are not distinct: releasereq appears twice
69. warning [2.1.1] line 734: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
70. warning [2.1.1] line 8757: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
71. warning [2.1.1] line 8757: Signal identifiers in signal list are not distinct: picresume appears twice
72. warning [2.1.1] line 991: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
73. warning [2.1.1] line 991: Signal identifiers in signal list are not distinct: releasereq appears twice
74. warning [4.1.11] line 17117: Redeclaration of variable, parameter or synonym legid
75. warning [4.1.11] line 17200: Redeclaration of variable, parameter or synonym legid
76. warning [4.1.11] line 17238: Redeclaration of variable, parameter or synonym legid
77. warning [4.1.11] line 17274: Redeclaration of variable, parameter or synonym legid
78. warning [4.1.11] line 17350: Redeclaration of variable, parameter or synonym legid
79. warning [4.1.11] line 17447: Redeclaration of variable, parameter or synonym legid
80. warning [4.1.11] line 17505: Redeclaration of variable, parameter or synonym legid
81. warning [4.1.11] line 17567: Redeclaration of variable, parameter or synonym legid
82. warning [4.1.11] line 17610: Redeclaration of variable, parameter or synonym legid
83. warning [4.1.11] line 17649: Redeclaration of variable, parameter or synonym csid
84. warning [4.1.11] line 17700: Redeclaration of variable, parameter or synonym csid
85. warning [4.1.11] line 17723: Redeclaration of variable, parameter or synonym legid
86. warning [4.1.11] line 17776: Redeclaration of variable, parameter or synonym csid
87. warning [4.1.11] line 17822: Redeclaration of variable, parameter or synonym csid
88. warning [4.1.11] line 17822: Redeclaration of variable, parameter or synonym legid
89. warning [4.1.11] line 17857: Redeclaration of variable, parameter or synonym csid
90. warning [4.1.11] line 17968: Redeclaration of variable, parameter or synonym legid
91. warning [4.1.11] line 17969: Redeclaration of variable, parameter or synonym csid
92. warning [4.1.11] line 17992: Redeclaration of variable, parameter or synonym csaid
93. warning [4.1.11] line 18029: Redeclaration of variable, parameter or synonym csaid
94. warning [4.1.11] line 18106: Redeclaration of variable, parameter or synonym csa
95. warning [4.1.11] line 18106: Redeclaration of variable, parameter or synonym csaid
96. warning [4.1.11] line 18144: Redeclaration of variable, parameter or synonym csa
97. warning [4.1.11] line 18144: Redeclaration of variable, parameter or synonym bcsmid
98. warning [4.1.11] line 18167: Redeclaration of variable, parameter or synonym csa
99. warning [4.1.11] line 18190: Redeclaration of variable, parameter or synonym csaid
100. warning [4.1.11] line 18190: Redeclaration of variable, parameter or synonym csa

101. warning [4.1.11] line 18334: Redeclaration of variable, parameter or synonym bcsmid
102. warning [4.1.11] line 18335: Redeclaration of variable, parameter or synonym csa
103. warning [4.1.11] line 18375: Redeclaration of variable, parameter or synonym csa
104. warning [4.1.11] line 18424: Redeclaration of variable, parameter or synonym legid
105. warning [4.1.11] line 18426: Redeclaration of variable, parameter or synonym servicekey
106. warning [4.1.11] line 18579: Redeclaration of variable, parameter or synonym legid
107. warning [4.1.11] line 18581: Redeclaration of variable, parameter or synonym servicekey
108. warning [4.1.11] line 18633: Redeclaration of variable, parameter or synonym cirarg
109. warning [4.1.11] line 18669: Redeclaration of variable, parameter or synonym legid
110. warning [4.1.11] line 18683: Redeclaration of variable, parameter or synonym servicekey
111. warning [4.1.11] line 18747: Redeclaration of variable, parameter or synonym legid
112. warning [4.1.11] line 18748: Redeclaration of variable, parameter or synonym eventtypebcsm
113. warning [4.1.11] line 18843: Redeclaration of variable, parameter or synonym legid
114. warning [4.1.11] line 18894: Redeclaration of variable, parameter or synonym legid
115. warning [4.1.11] line 18895: Redeclaration of variable, parameter or synonym servicekey
116. warning [4.1.11] line 18968: Redeclaration of variable, parameter or synonym legid
117. warning [4.1.11] line 18969: Redeclaration of variable, parameter or synonym servicekey
118. warning [4.1.11] line 19075: Redeclaration of variable, parameter or synonym legid
119. warning [4.1.11] line 19076: Redeclaration of variable, parameter or synonym eventtypebcsm
120. warning [4.1.11] line 19258: Redeclaration of variable, parameter or synonym ciarg
121. warning [4.1.11] line 19310: Redeclaration of variable, parameter or synonym coarg
122. warning [4.1.11] line 19414: Redeclaration of variable, parameter or synonym ctarg
123. warning [4.1.11] line 19515: Redeclaration of variable, parameter or synonym legid
124. warning [4.1.11] line 19516: Redeclaration of variable, parameter or synonym eventtypebcsm
125. warning [4.1.11] line 19517: Redeclaration of variable, parameter or synonym servicekey
126. warning [4.1.11] line 19655: Redeclaration of variable, parameter or synonym legid
127. warning [4.1.11] line 19656: Redeclaration of variable, parameter or synonym eventtypebcsm
128. warning [4.1.11] line 19657: Redeclaration of variable, parameter or synonym servicekey
129. warning [4.1.11] line 19699: Redeclaration of variable, parameter or synonym icaarg
130. warning [4.1.11] line 19837: Redeclaration of variable, parameter or synonym rcarg
131. warning [4.1.11] line 19879: Redeclaration of variable, parameter or synonym rncearg
132. warning [4.1.11] line 19931: Redeclaration of variable, parameter or synonym legid
133. warning [4.1.11] line 19933: Redeclaration of variable, parameter or synonym servicekey
134. warning [4.1.11] line 20025: Redeclaration of variable, parameter or synonym sfarg

135. warning [4.1.11] line 20077: Redeclaration of variable, parameter or synonym srarg
136. warning [4.1.11] line 20211: Redeclaration of variable, parameter or synonym legid
137. warning [4.1.11] line 20313: Redeclaration of variable, parameter or synonym dp
138. warning [4.1.11] line 20314: Redeclaration of variable, parameter or synonym legid
139. warning [4.1.11] line 20315: Redeclaration of variable, parameter or synonym party
140. warning [4.1.11] line 20634: Redeclaration of variable, parameter or synonym leg
141. warning [4.1.11] line 20634: Redeclaration of variable, parameter or synonym legid
142. warning [4.1.11] line 20710: Redeclaration of variable, parameter or synonym leg
143. warning [4.1.11] line 20711: Redeclaration of variable, parameter or synonym legid
144. warning [4.1.11] line 20794: Redeclaration of variable, parameter or synonym legid
145. warning [4.1.11] line 20853: Redeclaration of variable, parameter or synonym cs
146. warning [4.1.11] line 20853: Redeclaration of variable, parameter or synonym csid
147. warning [4.1.11] line 20879: Redeclaration of variable, parameter or synonym leg
148. warning [4.1.11] line 20879: Redeclaration of variable, parameter or synonym legid
149. warning [4.1.11] line 20891: Redeclaration of variable, parameter or synonym csid
150. warning [4.1.11] line 20935: Redeclaration of variable, parameter or synonym cs
151. warning [4.1.11] line 20936: Redeclaration of variable, parameter or synonym csid
152. warning [4.1.11] line 20962: Redeclaration of variable, parameter or synonym legid
153. warning [4.1.11] line 20963: Redeclaration of variable, parameter or synonym leg
154. warning [4.1.11] line 20964: Redeclaration of variable, parameter or synonym csid
155. warning [4.1.11] line 21019: Redeclaration of variable, parameter or synonym legid
156. warning [4.1.11] line 21020: Redeclaration of variable, parameter or synonym leg
157. warning [4.1.11] line 21103: Redeclaration of variable, parameter or synonym csid
158. warning [4.1.11] line 21162: Redeclaration of variable, parameter or synonym csid
159. warning [4.1.11] line 21185: Redeclaration of variable, parameter or synonym legid
160. warning [4.1.11] line 21282: Redeclaration of variable, parameter or synonym legid
161. warning [4.1.11] line 21283: Redeclaration of variable, parameter or synonym exporteventrecord
162. warning [4.1.11] line 21296: Redeclaration of variable, parameter or synonym servicekey
163. warning [4.1.11] line 21368: Redeclaration of variable, parameter or synonym legid
164. warning [4.1.11] line 21369: Redeclaration of variable, parameter or synonym importeventrecord
165. warning [4.1.11] line 21382: Redeclaration of variable, parameter or synonym servicekey
166. warning [4.1.11] line 21482: Redeclaration of variable, parameter or synonym dlarg
167. warning [4.1.11] line 21555: Redeclaration of variable, parameter or synonym ocarg
168. warning [4.1.11] line 21607: Redeclaration of variable, parameter or synonym rarg

169. warning [4.1.11] line 21701: Redeclaration of variable, parameter or synonym slarg

Appendix B.III

Geodecheck report for .pr file exported from SDT and manually edited so that it does not contain SDL referenced keyword.

Report is sorted so that errors are shown first.

79 errors

156 warnings

(291 information)

1. error [12.22] line 8438: Signal continuecsprim no referenced in gate scf signalist
2. error [12.22] line 8438: Signal reportutsiprim no referenced in gate scf signalist
3. error [12.22] line 8441: Signal networksuspendind no referenced in gate sigcon signalist
4. error [12.22] line 8441: Signal networksuspendreq no referenced in gate sigcon signalist
5. error [12.22] line 8444: Signal networksuspendreqind no referenced in gate ibi signalist
6. error [12.22] line 8444: Signal networksuspendreqind no referenced in gate ibi signalist
7. error [12.22] line 8447: Signal continuecs no referenced in gate csa signalist
8. error [12.22] line 8447: Signal continuecs no referenced in gate ih signalist
9. error [12.22] line 8447: Signal reportutsi no referenced in gate ih signalist
10. error [12.22] line 8447: Signal reportutsi no referenced in gate csa signalist
11. error [12.22] line 8450: Signal continuecs no referenced in gate cs signalist
12. error [12.22] line 8450: Signal continuecs no referenced in gate csa signalist
13. error [12.22] line 8450: Signal reportutsi no referenced in gate csa signalist
14. error [12.22] line 8450: Signal reportutsi no referenced in gate cs signalist
15. error [12.22] line 8453: Signal networksuspendind no referenced in gate t signalist
16. error [12.22] line 8453: Signal networksuspendind no referenced in gate cs signalist
17. error [12.22] line 8453: Signal networksuspendreqind no referenced in gate cs signalist
18. error [12.22] line 8453: Signal networksuspendreqind no referenced in gate t signalist
19. error [12.22] line 8456: Signal continuecs no referenced in gate ssf signalist
20. error [12.22] line 8456: Signal continuecs no referenced in gate cs signalist
21. error [12.22] line 8456: Signal reportutsi no referenced in gate cs signalist
22. error [12.22] line 8456: Signal reportutsi no referenced in gate ssf signalist
23. error [12.22] line 8459: Signal networksuspendreq no referenced in gate cs signalist
24. error [12.22] line 8459: Signal networksuspendreq no referenced in gate o signalist
25. error [12.22] line 8459: Signal networksuspendreqind no referenced in gate o signalist
26. error [12.22] line 8459: Signal networksuspendreqind no referenced in gate cs signalist

27. error [12.22] line 8551: Signal continuecsprim no referenced in gate scf signalist
28. error [12.22] line 8551: Signal reportutsiprim no referenced in gate scf signalist
29. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
30. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
31. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
32. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
33. error [12.22] line 8559: Signal networksuspendind no referenced in gate sigcon signalist
34. error [12.22] line 8559: Signal networksuspendreq no referenced in gate sigcon signalist
35. error [12.22] line 8563: Signal networksuspendind no referenced in gate sigcon signalist
36. error [12.22] line 8563: Signal networksuspendreq no referenced in gate sigcon signalist
37. error [12.22] line 8567: Signal continuecsprim no referenced in gate scf signalist
38. error [12.22] line 8567: Signal reportutsiprim no referenced in gate scf signalist
39. error [12.54] line 1458: Qualifier in definition ignored
40. error [12.54] line 1578: Qualifier in definition ignored
41. error [12.54] line 1611: Qualifier in definition ignored
42. error [12.54] line 1620: Qualifier in definition ignored
43. error [12.54] line 2425: Qualifier in definition ignored
44. error [12.54] line 2690: Qualifier in definition ignored
45. error [12.54] line 3: Qualifier in definition ignored
46. error [12.54] line 3820: Qualifier in definition ignored
47. error [12.54] line 4554: Qualifier in definition ignored
48. error [12.54] line 5846: Qualifier in definition ignored
49. error [12.54] line 5852: Qualifier in definition ignored
50. error [12.54] line 6300: Qualifier in definition ignored
51. error [12.54] line 6432: Qualifier in definition ignored
52. error [12.54] line 6866: Qualifier in definition ignored
53. error [12.54] line 7: Qualifier in definition ignored
54. error [12.54] line 7238: Qualifier in definition ignored
55. error [12.54] line 7265: Qualifier in definition ignored
56. error [12.54] line 7290: Qualifier in definition ignored
57. error [12.54] line 760: Qualifier in definition ignored
58. error [12.54] line 772: Qualifier in definition ignored
59. error [12.54] line 7943: Qualifier in definition ignored
60. error [12.54] line 7948: Qualifier in definition ignored

61. error [12.54] line 7965: Qualifier in definition ignored
62. error [12.54] line 7981: Qualifier in definition ignored
63. error [12.54] line 811: Qualifier in definition ignored
64. error [12.54] line 848: Qualifier in definition ignored
65. error [12.54] line 857: Qualifier in definition ignored
66. error [12.54] line 865: Qualifier in definition ignored
67. error [3.3.3] line 7548: Created process o_bcsm must be defined in the same block
68. error [3.3.3] line 7559: Created process o_bcsm must be defined in the same block
69. error [3.3.3] line 7591: Created process o_bcsm must be defined in the same block
70. error [3.3.3] line 7721: Created process o_bcsm must be defined in the same block
71. error [3.3.3] line 7742: Created process o_bcsm must be defined in the same block
72. error [3.3.6] line 2620: Same sort integer must be specified for formal and actual IN/OUT parameter
73. error [3.3.6] line 2748: Same sort integer must be specified for formal and actual IN/OUT parameter
74. error [6.5] line 5852: Invalid qualifier: identifier ssf_fsm is not visible
75. error [6.5] line 6300: Invalid qualifier: identifier interfacehandler is not visible
76. error [6.5] line 6432: Invalid qualifier: identifier originatingbcsm is not visible
77. error [6.5] line 6866: Invalid qualifier: identifier terminatingbcsm is not visible
78. error [6.5] line 7238: Invalid qualifier: identifier callsegment is not visible
79. error [6.5] line 7943: Invalid qualifier: identifier callsegmentassociation is not visible

Appendix B.IV

Geodecheck report for .pr file exported from SDT and manually edited so that it does not contain references and so that qualifiers are removed

Report is sorted so that errors are shown first.

51 errors

156 warnings

(291 information)

1. error [12.22] line 8438: Signal continuecsprim no referenced in gate scf signalist
2. error [12.22] line 8438: Signal reportutsiprim no referenced in gate scf signalist
3. error [12.22] line 8441: Signal networksuspendind no referenced in gate sigcon signalist
4. error [12.22] line 8441: Signal networksuspendreq no referenced in gate sigcon signalist
5. error [12.22] line 8444: Signal networksuspendreqind no referenced in gate ibi signalist
6. error [12.22] line 8444: Signal networksuspendreqind no referenced in gate ibi signalist
7. error [12.22] line 8447: Signal continuecs no referenced in gate csa signalist
8. error [12.22] line 8447: Signal continuecs no referenced in gate ih signalist

9. error [12.22] line 8447: Signal reportutsi no referenced in gate ih signalist
10. error [12.22] line 8447: Signal reportutsi no referenced in gate csa signalist
11. error [12.22] line 8450: Signal continuecs no referenced in gate cs signalist
12. error [12.22] line 8450: Signal continuecs no referenced in gate csa signalist
13. error [12.22] line 8450: Signal reportutsi no referenced in gate csa signalist
14. error [12.22] line 8450: Signal reportutsi no referenced in gate cs signalist
15. error [12.22] line 8453: Signal networksuspendind no referenced in gate t signalist
16. error [12.22] line 8453: Signal networksuspendind no referenced in gate cs signalist
17. error [12.22] line 8453: Signal networksuspendreqind no referenced in gate cs signalist
18. error [12.22] line 8453: Signal networksuspendreqind no referenced in gate t signalist
19. error [12.22] line 8456: Signal continuecs no referenced in gate ssf signalist
20. error [12.22] line 8456: Signal continuecs no referenced in gate cs signalist
21. error [12.22] line 8456: Signal reportutsi no referenced in gate cs signalist
22. error [12.22] line 8456: Signal reportutsi no referenced in gate ssf signalist
23. error [12.22] line 8459: Signal networksuspendreq no referenced in gate cs signalist
24. error [12.22] line 8459: Signal networksuspendreq no referenced in gate o signalist
25. error [12.22] line 8459: Signal networksuspendreqind no referenced in gate o signalist
26. error [12.22] line 8459: Signal networksuspendreqind no referenced in gate cs signalist
27. error [12.22] line 8551: Signal continuecsprim no referenced in gate scf signalist
28. error [12.22] line 8551: Signal reportutsiprim no referenced in gate scf signalist
29. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
30. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
31. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
32. error [12.22] line 8555: Signal networksuspendreqind no referenced in gate ibi signalist
33. error [12.22] line 8559: Signal networksuspendind no referenced in gate sigcon signalist
34. error [12.22] line 8559: Signal networksuspendreq no referenced in gate sigcon signalist
35. error [12.22] line 8563: Signal networksuspendind no referenced in gate sigcon signalist
36. error [12.22] line 8563: Signal networksuspendreq no referenced in gate sigcon signalist
37. error [12.22] line 8567: Signal continuecsprim no referenced in gate scf signalist
38. error [12.22] line 8567: Signal reportutsiprim no referenced in gate scf signalist
39. error [3.3.3] line 7548: Created process o_bcsm must be defined in the same block
40. error [3.3.3] line 7559: Created process o_bcsm must be defined in the same block
41. error [3.3.3] line 7591: Created process o_bcsm must be defined in the same block
42. error [3.3.3] line 7721: Created process o_bcsm must be defined in the same block

43. error [3.3.3] line 7742: Created process o_bcsm must be defined in the same block
44. error [3.3.6] line 2620: Same sort integer must be specified for formal and actual IN/OUT parameter
45. error [3.3.6] line 2748: Same sort integer must be specified for formal and actual IN/OUT parameter
46. error [6.5] line 5852: Invalid qualifier: identifier ssf_fsm is not visible
47. error [6.5] line 6300: Invalid qualifier: identifier interfacehandler is not visible
48. error [6.5] line 6432: Invalid qualifier: identifier originatingbcsm is not visible
49. error [6.5] line 6866: Invalid qualifier: identifier terminatingbcsm is not visible
50. error [6.5] line 7238: Invalid qualifier: identifier callsegment is not visible
51. error [6.5] line 7943: Invalid qualifier: identifier callsegmentassociation is not visible

Appendix B.V

Geodecheck report inap model exported from SDT and manually edited so that it does not contain SDL referenced keyword and qualifiers in names are removed. The .pr was read in Geodedit and saved before analysis.

Report is sorted so that errors are shown first.

381 errors

136 warnings

(344 information)

1. error [12.38] line 15461: New definition without virtuality transmission for interfacehandler
2. error [12.38] line 15858: New definition without virtuality transmission for originatingbcsm
3. error [12.38] line 16960: New definition without virtuality transmission for terminatingbcsm
4. error [12.38] line 19939: New definition without virtuality transmission for callsegmentassociation
5. error [12.60] line 16008: Transition with invalid virtuality
6. error [12.60] line 16270: Transition with invalid virtuality
7. error [12.60] line 16270: Transition with invalid virtuality
8. error [12.60] line 16270: Transition with invalid virtuality
9. error [12.60] line 16270: Transition with invalid virtuality
10. error [12.60] line 16411: Transition with invalid virtuality
11. error [12.60] line 16449: Transition with invalid virtuality
12. error [12.60] line 16594: Transition with invalid virtuality
13. error [12.60] line 16702: Transition with invalid virtuality
14. error [12.60] line 16919: Transition with invalid virtuality
15. error [12.60] line 17098: Transition with invalid virtuality
16. error [12.60] line 17205: Transition with invalid virtuality
17. error [12.60] line 17230: Transition with invalid virtuality
18. error [12.60] line 17348: Transition with invalid virtuality

19. error [12.60] line 17394: Transition with invalid virtuality
20. error [12.60] line 17862: Transition with invalid virtuality
21. error [12.60] line 17862: Transition with invalid virtuality
22. error [12.60] line 17862: Transition with invalid virtuality
23. error [12.60] line 17883: Transition with invalid virtuality
24. error [12.60] line 20909: Transition with invalid virtuality
25. error [12.60] line 20909: Transition with invalid virtuality
26. error [12.60] line 20909: Transition with invalid virtuality
27. error [12.60] line 21091: Transition with invalid virtuality
28. error [12.60] line 21091: Transition with invalid virtuality
29. error [12.60] line 21091: Transition with invalid virtuality
30. error [12.60] line 21135: Transition with invalid virtuality
31. error [12.60] line 21135: Transition with invalid virtuality
32. error [12.60] line 21135: Transition with invalid virtuality
33. error [12.60] line 21197: Transition with invalid virtuality
34. error [12.60] line 21197: Transition with invalid virtuality
35. error [12.60] line 21197: Transition with invalid virtuality
36. error [12.61] line 16922: Valid input signals set not compatible in CALL statement: servicefeatureind is illegal in common queue
37. error [12.61] line 16922: Valid input signals set not compatible in CALL statement: picresume is illegal in common queue
38. error [12.61] line 17894: Valid input signals set not compatible in CALL statement: servicefeatureind is illegal in common queue
39. error [12.61] line 17894: Valid input signals set not compatible in CALL statement: picresume is illegal in common queue
40. error [12.62] line 16922: Valid output signals set not compatible in CALL statement: dp is illegal in common queue
41. error [12.62] line 17894: Valid output signals set not compatible in CALL statement: dp is illegal in common queue
42. error [12.88] line 16689: Time expression expected in SET statement for timer without duration ground expression
43. error [3.1.5] line 16008: setupind is illegal for common queue
44. error [3.1.5] line 16030: picresume is illegal for common queue
45. error [3.1.5] line 16179: picresume is illegal for common queue
46. error [3.1.5] line 16201: releaseind is illegal for common queue
47. error [3.1.5] line 16214: releasereqind is illegal for common queue
48. error [3.1.5] line 16241: setupind is illegal for common queue

49. error [3.1.5] line 16257: picresume is illegal for common queue
50. error [3.1.5] line 16270: pic is illegal for common queue
51. error [3.1.5] line 16339: setupind is illegal for common queue
52. error [3.1.5] line 16355: picresume is illegal for common queue
53. error [3.1.5] line 16368: pic is illegal for common queue
54. error [3.1.5] line 16411: releasereqind is illegal for common queue
55. error [3.1.5] line 16429: picresume is illegal for common queue
56. error [3.1.5] line 16449: releaseind is illegal for common queue
57. error [3.1.5] line 16467: releasereqind is illegal for common queue
58. error [3.1.5] line 16479: releaseind is illegal for common queue
59. error [3.1.5] line 16491: picresume is illegal for common queue
60. error [3.1.5] line 16529: releasereqind is illegal for common queue
61. error [3.1.5] line 16544: releaseind is illegal for common queue
62. error [3.1.5] line 16577: servicefeatureind is illegal for common queue
63. error [3.1.5] line 16594: callprogressrespconf is illegal for common queue
64. error [3.1.5] line 16673: picresume is illegal for common queue
65. error [3.1.5] line 16702: picresume is illegal for common queue
66. error [3.1.5] line 16849: picresume is illegal for common queue
67. error [3.1.5] line 16893: picresume is illegal for common queue
68. error [3.1.5] line 16919: picresume is illegal for common queue
69. error [3.1.5] line 16947: bcsmstop is illegal for common queue
70. error [3.1.5] line 17098: setupreqind is illegal for common queue
71. error [3.1.5] line 17119: pic is illegal for common queue
72. error [3.1.5] line 17142: picresume is illegal for common queue
73. error [3.1.5] line 17205: picresume is illegal for common queue
74. error [3.1.5] line 17230: terminatinglinestate is illegal for common queue
75. error [3.1.5] line 17309: picresume is illegal for common queue
76. error [3.1.5] line 17348: callprogressind is illegal for common queue
77. error [3.1.5] line 17394: releaseind is illegal for common queue
78. error [3.1.5] line 17443: picresume is illegal for common queue
79. error [3.1.5] line 17493: picresume is illegal for common queue
80. error [3.1.5] line 17516: releasereqind is illegal for common queue
81. error [3.1.5] line 17546: releaseind is illegal for common queue
82. error [3.1.5] line 17557: servicefeatureind is illegal for common queue

83. error [3.1.5] line 17574: picresume is illegal for common queue
84. error [3.1.5] line 17598: setupconf is illegal for common queue
85. error [3.1.5] line 17614: picresume is illegal for common queue
86. error [3.1.5] line 17627: pic is illegal for common queue
87. error [3.1.5] line 17696: releasereqind is illegal for common queue
88. error [3.1.5] line 17722: releaseind is illegal for common queue
89. error [3.1.5] line 17748: servicefeatureind is illegal for common queue
90. error [3.1.5] line 17765: picresume is illegal for common queue
91. error [3.1.5] line 17783: releasereqind is illegal for common queue
92. error [3.1.5] line 17806: releaseind is illegal for common queue
93. error [3.1.5] line 17818: servicefeatureind is illegal for common queue
94. error [3.1.5] line 17834: picresume is illegal for common queue
95. error [3.1.5] line 17848: picresume is illegal for common queue
96. error [3.1.5] line 17862: releasereqind is illegal for common queue
97. error [3.1.5] line 17883: picresume is illegal for common queue
98. error [3.1.5] line 17901: setupconf is illegal for common queue
99. error [3.1.5] line 17914: callprogressind is illegal for common queue
100. error [3.1.5] line 17942: bcsmstop is illegal for common queue
101. error [3.1.5] line 20476: initiatecallattempt is illegal for common queue
102. error [3.1.5] line 20626: initiatecallattempt is illegal for common queue
103. error [3.1.5] line 20909: csstop is illegal for common queue
104. error [3.1.5] line 21091: applicationbegin is illegal for common queue
105. error [3.1.5] line 21135: applicationend is illegal for common queue
106. error [3.1.5] line 21197: applicationabort is illegal for common queue
107. error [3.3.12] line 15568: Invalid assignment variable
108. error [3.3.12] line 15585: Invalid assignment variable
109. error [3.3.12] line 15598: Invalid assignment variable
110. error [3.3.12] line 15611: Invalid assignment variable
111. error [3.3.12] line 15624: Invalid assignment variable
112. error [3.3.12] line 15637: Invalid assignment variable
113. error [3.3.12] line 15798: Invalid assignment variable
114. error [3.3.12] line 15815: Invalid assignment variable
115. error [3.3.12] line 15844: Invalid assignment variable
116. error [3.3.12] line 16011: Invalid assignment variable

117. error [3.3.12] line 16014: Invalid assignment variable
118. error [3.3.12] line 16295: Invalid assignment variable
119. error [3.3.12] line 16295: Invalid assignment variable
120. error [3.3.12] line 16677: Invalid assignment variable
121. error [3.3.12] line 16896: Invalid assignment variable
122. error [3.3.12] line 16899: Invalid assignment variable
123. error [3.3.12] line 16899: Invalid assignment variable
124. error [3.3.12] line 16938: Invalid assignment variable
125. error [3.3.12] line 17102: Invalid assignment variable
126. error [3.3.12] line 17102: Invalid assignment variable
127. error [3.3.12] line 17240: Invalid assignment variable
128. error [3.3.12] line 17247: Invalid assignment variable
129. error [3.3.12] line 17259: Invalid assignment variable
130. error [3.3.12] line 17268: Invalid assignment variable
131. error [3.3.12] line 17277: Invalid assignment variable
132. error [3.3.12] line 17446: Invalid assignment variable
133. error [3.3.12] line 17446: Invalid assignment variable
134. error [3.3.12] line 17886: Invalid assignment variable
135. error [3.3.12] line 17886: Invalid assignment variable
136. error [3.3.12] line 17886: Invalid assignment variable
137. error [3.3.12] line 17933: Invalid assignment variable
138. error [3.3.12] line 20068: Invalid assignment variable
139. error [3.3.12] line 20113: Invalid assignment variable
140. error [3.3.12] line 20142: Invalid assignment variable
141. error [3.3.12] line 20320: Invalid assignment variable
142. error [3.3.12] line 20347: Invalid assignment variable
143. error [3.3.12] line 20350: Invalid assignment variable
144. error [3.3.12] line 20373: Invalid assignment variable
145. error [3.3.12] line 20734: Invalid assignment variable
146. error [3.3.12] line 20755: Invalid assignment variable
147. error [3.3.12] line 20950: Invalid assignment variable
148. error [3.3.12] line 20967: Invalid assignment variable
149. error [3.3.12] line 21246: Invalid assignment variable
150. error [3.3.12] line 21263: Invalid assignment variable

151. error [3.3.12] line 21292: Invalid assignment variable
152. error [3.3.3] line 18798: Created process o_bcsm must be defined in the same block
153. error [3.3.3] line 18832: Created process o_bcsm must be defined in the same block
154. error [3.3.3] line 18920: Created process o_bcsm must be defined in the same block
155. error [3.3.3] line 19257: Created process o_bcsm must be defined in the same block
156. error [3.3.3] line 19321: Created process o_bcsm must be defined in the same block
157. error [3.3.6] line 8258: Same sort integer must be specified for formal and actual IN/OUT parameter
158. error [3.3.6] line 8626: Same sort integer must be specified for formal and actual IN/OUT parameter
159. error [3.4.3] line 16017: Signal dp in output has no possible receiver
160. error [3.4.3] line 16166: Signal dp in output has no possible receiver
161. error [3.4.3] line 16206: Signal dp in output has no possible receiver
162. error [3.4.3] line 16217: Signal dp in output has no possible receiver
163. error [3.4.3] line 16234: Signal dpdisconnect in output has no possible receiver
164. error [3.4.3] line 16244: Signal dp in output has no possible receiver
165. error [3.4.3] line 16286: Signal reconnectreq in output has no possible receiver
166. error [3.4.3] line 16299: Signal releasereqind in output has no possible receiver
167. error [3.4.3] line 16302: Signal bcsmstop in output has no possible receiver
168. error [3.4.3] line 16314: Signal bcsmstop in output has no possible receiver
169. error [3.4.3] line 16332: Signal dpdisconnect in output has no possible receiver
170. error [3.4.3] line 16342: Signal dp in output has no possible receiver
171. error [3.4.3] line 16384: Signal reconnectreq in output has no possible receiver
172. error [3.4.3] line 16396: Signal bcsmstop in output has no possible receiver
173. error [3.4.3] line 16415: Signal dp in output has no possible receiver
174. error [3.4.3] line 16436: Signal bcsmstop in output has no possible receiver
175. error [3.4.3] line 16453: Signal dp in output has no possible receiver
176. error [3.4.3] line 16471: Signal dp in output has no possible receiver
177. error [3.4.3] line 16483: Signal dp in output has no possible receiver
178. error [3.4.3] line 16519: Signal dp in output has no possible receiver
179. error [3.4.3] line 16536: Signal dp in output has no possible receiver
180. error [3.4.3] line 16555: Signal dp in output has no possible receiver
181. error [3.4.3] line 16581: Signal dp in output has no possible receiver
182. error [3.4.3] line 16633: Signal dp in output has no possible receiver
183. error [3.4.3] line 16648: Signal callprogress in output has no possible receiver
184. error [3.4.3] line 16680: Signal callprogress in output has no possible receiver

185. error [3.4.3] line 16903: Signal setupreqind in output has no possible receiver
186. error [3.4.3] line 17106: Signal dp in output has no possible receiver
187. error [3.4.3] line 17217: Signal checkterminatinglinestate in output has no possible receiver
188. error [3.4.3] line 17250: Signal dp in output has no possible receiver
189. error [3.4.3] line 17280: Signal setupreq in output has no possible receiver
190. error [3.4.3] line 17362: Signal dp in output has no possible receiver
191. error [3.4.3] line 17375: Signal callprogressrespconf in output has no possible receiver
192. error [3.4.3] line 17450: Signal callprogressrespconf in output has no possible receiver
193. error [3.4.3] line 17480: Signal dp in output has no possible receiver
194. error [3.4.3] line 17530: Signal dpdisconnect in output has no possible receiver
195. error [3.4.3] line 17550: Signal dpdisconnect in output has no possible receiver
196. error [3.4.3] line 17561: Signal dp in output has no possible receiver
197. error [3.4.3] line 17591: Signal dpdisconnect in output has no possible receiver
198. error [3.4.3] line 17601: Signal dp in output has no possible receiver
199. error [3.4.3] line 17643: Signal reconnectreq in output has no possible receiver
200. error [3.4.3] line 17652: Signal bcsmstop in output has no possible receiver
201. error [3.4.3] line 17664: Signal bcsmstop in output has no possible receiver
202. error [3.4.3] line 17686: Signal dp in output has no possible receiver
203. error [3.4.3] line 17733: Signal dpdisconnect in output has no possible receiver
204. error [3.4.3] line 17752: Signal dp in output has no possible receiver
205. error [3.4.3] line 17810: Signal dpdisconnect in output has no possible receiver
206. error [3.4.3] line 17821: Signal dp in output has no possible receiver
207. error [3.4.3] line 17869: Signal dpdisconnect in output has no possible receiver
208. error [3.4.3] line 17891: Signal releasereqind in output has no possible receiver
209. error [3.4.3] line 17907: Signal dp in output has no possible receiver
210. error [5.4.2] line 20068: Operator term cannot be used in this context
211. error [5.4.2] line 20113: Operator term cannot be used in this context
212. error [5.4.2] line 20142: Operator term cannot be used in this context
213. error [5.4.2] line 20184: Operator term cannot be used in this context
214. error [5.4.2] line 20268: Operator term cannot be used in this context
215. error [5.4.2] line 20320: Operator term cannot be used in this context
216. error [5.4.2] line 20323: Operator term cannot be used in this context
217. error [5.4.2] line 20347: Operator term cannot be used in this context
218. error [5.4.2] line 20350: Operator term cannot be used in this context

219. error [5.4.2] line 20373: Operator term cannot be used in this context
220. error [6.2] line 15476: GATE scf undefined
221. error [6.2] line 15487: GATE sigcon undefined
222. error [6.2] line 15498: GATE ibi undefined
223. error [6.2] line 15509: GATE csa undefined
224. error [6.2] line 15568: VARIABLE csa undefined
225. error [6.2] line 15585: VARIABLE csa undefined
226. error [6.2] line 15598: VARIABLE csa undefined
227. error [6.2] line 15611: VARIABLE csa undefined
228. error [6.2] line 15624: VARIABLE csa undefined
229. error [6.2] line 15637: VARIABLE csa undefined
230. error [6.2] line 15656: PROCEDURE getcsafromcsaid undefined
231. error [6.2] line 15670: PROCEDURE getcsafromcsaid undefined
232. error [6.2] line 15687: PROCEDURE getcsaidfromcsa undefined
233. error [6.2] line 15705: PROCEDURE getcsaidfromcsa undefined
234. error [6.2] line 15725: PROCEDURE iscsa undefined
235. error [6.2] line 15762: PROCEDURE iscsa undefined
236. error [6.2] line 15798: VARIABLE csa undefined
237. error [6.2] line 15815: VARIABLE csa undefined
238. error [6.2] line 15844: VARIABLE csa undefined
239. error [6.2] line 15873: GATE cs undefined
240. error [6.2] line 16011: VARIABLE sigconid undefined
241. error [6.2] line 16014: VARIABLE sigconid undefined
242. error [6.2] line 16036: VARIABLE enbloc undefined
243. error [6.2] line 16295: VARIABLE rarg undefined
244. error [6.2] line 16296: VARIABLE rarg undefined
245. error [6.2] line 16584: STATE wait_o_mid_call undefined
246. error [6.2] line 16677: VARIABLE cparg undefined
247. error [6.2] line 16689: SIGNAL (or TIMER) noanswert undefined
248. error [6.2] line 16720: VARIABLE success undefined
249. error [6.2] line 16863: VARIABLE success undefined
250. error [6.2] line 16896: VARIABLE t_bcsm_existing_flag undefined
251. error [6.2] line 16899: VARIABLE sarg undefined
252. error [6.2] line 16900: VARIABLE sarg undefined

253. error [6.2] line 16938: VARIABLE cs undefined
254. error [6.2] line 16975: GATE cs undefined
255. error [6.2] line 17102: VARIABLE rembcsmid undefined
256. error [6.2] line 17103: VARIABLE rembcsmid undefined
257. error [6.2] line 17156: VARIABLE success undefined
258. error [6.2] line 17217: VARIABLE sarg undefined
259. error [6.2] line 17240: VARIABLE cs1reason undefined
260. error [6.2] line 17247: VARIABLE cs1reason undefined
261. error [6.2] line 17259: VARIABLE cs1reason undefined
262. error [6.2] line 17268: VARIABLE cs1reason undefined
263. error [6.2] line 17277: VARIABLE sarg undefined
264. error [6.2] line 17314: VARIABLE success undefined
265. error [6.2] line 17398: VARIABLE cs1cause undefined
266. error [6.2] line 17446: VARIABLE cparg undefined
267. error [6.2] line 17447: VARIABLE cparg undefined
268. error [6.2] line 17457: SIGNAL (or TIMER) noanswert undefined
269. error [6.2] line 17457: VARIABLE noanswervalue undefined
270. error [6.2] line 17463: STATE wait_for_b_party_answer undefined
271. error [6.2] line 17509: SIGNAL (or TIMER) suspendt undefined
272. error [6.2] line 17509: VARIABLE suspendvalue undefined
273. error [6.2] line 17534: STATE wait_a_t_disconnect undefined
274. error [6.2] line 17553: STATE wait_b_t_disconnect undefined
275. error [6.2] line 17594: STATE wait_a_t_disconnect undefined
276. error [6.2] line 17689: SIGNAL (or TIMER) suspendt undefined
277. error [6.2] line 17707: SIGNAL (or TIMER) suspendt undefined
278. error [6.2] line 17726: SIGNAL (or TIMER) suspendt undefined
279. error [6.2] line 17737: STATE wait_b_t_disconnect undefined
280. error [6.2] line 17741: SIGNAL (or TIMER) suspendt undefined
281. error [6.2] line 17814: STATE wait_b_t_disconnect undefined
282. error [6.2] line 17873: STATE wait_a_t_disconnect undefined
283. error [6.2] line 17886: VARIABLE rarg undefined
284. error [6.2] line 17887: VARIABLE rarg undefined
285. error [6.2] line 17888: VARIABLE rarg undefined
286. error [6.2] line 17933: VARIABLE cs undefined

287. error [6.2] line 19954: GATE ih undefined
288. error [6.2] line 19965: GATE cs undefined
289. error [6.2] line 20051: PROCEDURE getleglocation undefined
290. error [6.2] line 20054: PROCEDURE getcsptr undefined
291. error [6.2] line 20099: PROCEDURE getcsptr undefined
292. error [6.2] line 20392: PROCEDURE existleg undefined
293. error [6.2] line 20480: PROCEDURE existleg undefined
294. error [6.2] line 20549: PROCEDURE existleg undefined
295. error [6.2] line 20630: PROCEDURE existleg undefined
296. error [6.2] line 20734: VARIABLE csid undefined
297. error [6.2] line 20738: PROCEDURE getcsptr undefined
298. error [6.2] line 20755: VARIABLE csid undefined
299. error [6.2] line 20768: PROCEDURE getcsptr undefined
300. error [6.2] line 20774: PROCEDURE setleglocation undefined
301. error [6.2] line 20779: PROCEDURE getcsptr undefined
302. error [6.2] line 20798: PROCEDURE existleg undefined
303. error [6.2] line 20836: PROCEDURE existcs undefined
304. error [6.2] line 20950: VARIABLE csid undefined
305. error [6.2] line 20953: PROCEDURE getcsptr undefined
306. error [6.2] line 20967: VARIABLE csid undefined
307. error [6.2] line 20970: PROCEDURE getcsptr undefined
308. error [6.2] line 21017: PROCEDURE iscs undefined
309. error [6.2] line 21056: PROCEDURE iscs undefined
310. error [6.2] line 21095: PROCEDURE iscs undefined
311. error [6.2] line 21139: PROCEDURE iscs undefined
312. error [6.2] line 21201: PROCEDURE iscs undefined
313. error [6.2] line 21246: VARIABLE csid undefined
314. error [6.2] line 21249: PROCEDURE getcsptr undefined
315. error [6.2] line 21263: VARIABLE csid undefined
316. error [6.2] line 21266: PROCEDURE getcsptr undefined
317. error [6.2] line 21292: VARIABLE csid undefined
318. error [6.2] line 21295: PROCEDURE getcsptr undefined
319. error [6.4] line 15978: VARIABLE legid of type integer undefined
320. error [6.4] line 16017: VARIABLE legid of type integer undefined

321. error [6.4] line 16166: VARIABLE legid of type integer undefined
322. error [6.4] line 16187: VARIABLE sigconid of type bcsmidtype undefined
323. error [6.4] line 16206: VARIABLE legid of type integer undefined
324. error [6.4] line 16217: VARIABLE legid of type integer undefined
325. error [6.4] line 16234: VARIABLE legid of type integer undefined
326. error [6.4] line 16244: VARIABLE legid of type integer undefined
327. error [6.4] line 16283: VARIABLE sigconid of type bcsmidtype undefined
328. error [6.4] line 16299: VARIABLE rarg of type releasetype undefined
329. error [6.4] line 16302: VARIABLE legid of type integer undefined
330. error [6.4] line 16314: VARIABLE legid of type integer undefined
331. error [6.4] line 16332: VARIABLE legid of type integer undefined
332. error [6.4] line 16342: VARIABLE legid of type integer undefined
333. error [6.4] line 16381: VARIABLE sigconid of type bcsmidtype undefined
334. error [6.4] line 16396: VARIABLE legid of type integer undefined
335. error [6.4] line 16415: VARIABLE legid of type integer undefined
336. error [6.4] line 16436: VARIABLE legid of type integer undefined
337. error [6.4] line 16453: VARIABLE legid of type integer undefined
338. error [6.4] line 16471: VARIABLE legid of type integer undefined
339. error [6.4] line 16483: VARIABLE legid of type integer undefined
340. error [6.4] line 16495: VARIABLE sigconid of type bcsmidtype undefined
341. error [6.4] line 16519: VARIABLE legid of type integer undefined
342. error [6.4] line 16536: VARIABLE legid of type integer undefined
343. error [6.4] line 16555: VARIABLE legid of type integer undefined
344. error [6.4] line 16581: VARIABLE legid of type integer undefined
345. error [6.4] line 16633: VARIABLE legid of type integer undefined
346. error [6.4] line 16645: VARIABLE sigconid of type bcsmidtype undefined
347. error [6.4] line 16680: VARIABLE cparg of type callprogresstype undefined
348. error [6.4] line 16903: VARIABLE sarg of type setuptype undefined
349. error [6.4] line 17068: VARIABLE legid of type integer undefined
350. error [6.4] line 17106: VARIABLE legid of type integer undefined
351. error [6.4] line 17217: VARIABLE bcsmid of type bcsmidtype undefined
352. error [6.4] line 17250: VARIABLE legid of type integer undefined
353. error [6.4] line 17280: VARIABLE sarg of type setuptype undefined
354. error [6.4] line 17362: VARIABLE legid of type integer undefined

355. error [6.4] line 17371: VARIABLE rembcsmid of type bcsmidtype undefined
356. error [6.4] line 17450: VARIABLE cparg of type callprogresstype undefined
357. error [6.4] line 17480: VARIABLE legid of type integer undefined
358. error [6.4] line 17501: VARIABLE rembcsmid of type bcsmidtype undefined
359. error [6.4] line 17530: VARIABLE legid of type integer undefined
360. error [6.4] line 17550: VARIABLE legid of type integer undefined
361. error [6.4] line 17561: VARIABLE legid of type integer undefined
362. error [6.4] line 17591: VARIABLE legid of type integer undefined
363. error [6.4] line 17601: VARIABLE legid of type integer undefined
364. error [6.4] line 17640: VARIABLE bcsmid of type bcsmidtype undefined
365. error [6.4] line 17652: VARIABLE legid of type integer undefined
366. error [6.4] line 17664: VARIABLE legid of type integer undefined
367. error [6.4] line 17686: VARIABLE legid of type integer undefined
368. error [6.4] line 17733: VARIABLE legid of type integer undefined
369. error [6.4] line 17752: VARIABLE legid of type integer undefined
370. error [6.4] line 17769: VARIABLE rembcsmid of type bcsmidtype undefined
371. error [6.4] line 17810: VARIABLE legid of type integer undefined
372. error [6.4] line 17821: VARIABLE legid of type integer undefined
373. error [6.4] line 17869: VARIABLE legid of type integer undefined
374. error [6.4] line 17891: VARIABLE rarg of type releasetype undefined
375. error [6.4] line 17907: VARIABLE legid of type integer undefined
376. error [6.5] line 14291: Invalid qualifier: identifier ssf_fsm is not visible
377. error [6.5] line 15461: Invalid qualifier: identifier interfacehandler is not visible
378. error [6.5] line 15858: Invalid qualifier: identifier originatingbcsm is not visible
379. error [6.5] line 16960: Invalid qualifier: identifier terminatingbcsm is not visible
380. error [6.5] line 17955: Invalid qualifier: identifier callsegment is not visible
381. error [6.5] line 19939: Invalid qualifier: identifier callsegmentassociation is not visible

Appendix B.VI

Geodecheck report inap model exported from SDT and manually edited so that it does not contain SDL referenced keyword and qualifiers in names are removed. The .pr was read in Geodedit and saved. Following this, the file had to be manually edited to correct some problems and then analysed by Geodecheck.

Report is sorted so that errors are shown first.

13 errors

156 warnings

(291 information)

1. error [3.3.3] line 18837: Created process o_bcsm must be defined in the same block
2. error [3.3.3] line 18871: Created process o_bcsm must be defined in the same block
3. error [3.3.3] line 18959: Created process o_bcsm must be defined in the same block
4. error [3.3.3] line 19296: Created process o_bcsm must be defined in the same block
5. error [3.3.3] line 19360: Created process o_bcsm must be defined in the same block
6. error [3.3.6] line 8258: Same sort integer must be specified for formal and actual IN/OUT parameter
7. error [3.3.6] line 8626: Same sort integer must be specified for formal and actual IN/OUT parameter
8. error [6.5] line 14330: Invalid qualifier: identifier ssf_fsm is not visible
9. error [6.5] line 15500: Invalid qualifier: identifier interfacehandler is not visible
10. error [6.5] line 15897: Invalid qualifier: identifier originatingbcsm is not visible
11. error [6.5] line 16999: Invalid qualifier: identifier terminatingbcsm is not visible
12. error [6.5] line 17994: Invalid qualifier: identifier callsegment is not visible
13. error [6.5] line 19978: Invalid qualifier: identifier callsegmentassociation is not visible
14. warning [2.1.1] line 1001: Signal identifiers in signal list are not distinct: releasereqind appears twice
15. warning [2.1.1] line 1001: Signal identifiers in signal list are not distinct: releasereqind appears twice
16. warning [2.1.1] line 1012: Signal identifiers in signal list are not distinct: releasereqind appears twice
17. warning [2.1.1] line 1012: Signal identifiers in signal list are not distinct: releasereqind appears twice
18. warning [2.1.1] line 1023: Signal identifiers in signal list are not distinct: releasereqind appears twice
19. warning [2.1.1] line 1023: Signal identifiers in signal list are not distinct: releasereqind appears twice
20. warning [2.1.1] line 1056: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
21. warning [2.1.1] line 1056: Signal identifiers in signal list are not distinct: releasereq appears twice
22. warning [2.1.1] line 1067: Signal identifiers in signal list are not distinct: releasereqind appears twice
23. warning [2.1.1] line 1067: Signal identifiers in signal list are not distinct: releasereqind appears twice
24. warning [2.1.1] line 1078: Signal identifiers in signal list are not distinct: releasereqind appears twice
25. warning [2.1.1] line 1078: Signal identifiers in signal list are not distinct: releasereqind appears twice
26. warning [2.1.1] line 14125: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
27. warning [2.1.1] line 14125: Signal identifiers in signal list are not distinct: releasereq appears twice
28. warning [2.1.1] line 14136: Signal identifiers in signal list are not distinct: releasereqind appears twice
29. warning [2.1.1] line 14136: Signal identifiers in signal list are not distinct: releasereqind appears twice
30. warning [2.1.1] line 14345: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
31. warning [2.1.1] line 14345: Signal identifiers in signal list are not distinct: picresume appears twice
32. warning [2.1.1] line 15526: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
33. warning [2.1.1] line 15526: Signal identifiers in signal list are not distinct: releasereq appears twice

34. warning [2.1.1] line 15537: Signal identifiers in signal list are not distinct: releasereqind appears twice
35. warning [2.1.1] line 15537: Signal identifiers in signal list are not distinct: releasereqind appears twice
36. warning [2.1.1] line 15548: Signal identifiers in signal list are not distinct: releasereqind appears twice
37. warning [2.1.1] line 15548: Signal identifiers in signal list are not distinct: releasereqind appears twice
38. warning [2.1.1] line 18009: Signal identifiers in signal list are not distinct: releasereqind appears twice
39. warning [2.1.1] line 18009: Signal identifiers in signal list are not distinct: releasereqind appears twice
40. warning [2.1.1] line 18020: Signal identifiers in signal list are not distinct: picresume appears twice
41. warning [2.1.1] line 18020: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
42. warning [2.1.1] line 19993: Signal identifiers in signal list are not distinct: releasereqind appears twice
43. warning [2.1.1] line 19993: Signal identifiers in signal list are not distinct: releasereqind appears twice
44. warning [2.1.1] line 20004: Signal identifiers in signal list are not distinct: releasereqind appears twice
45. warning [2.1.1] line 20004: Signal identifiers in signal list are not distinct: releasereqind appears twice
46. warning [2.1.1] line 3117: Signal identifiers in signal list are not distinct: releasereqind appears twice
47. warning [2.1.1] line 3117: Signal identifiers in signal list are not distinct: releasereqind appears twice
48. warning [2.1.1] line 3128: Signal identifiers in signal list are not distinct: releasereqind appears twice
49. warning [2.1.1] line 3128: Signal identifiers in signal list are not distinct: releasereqind appears twice
50. warning [2.1.1] line 4980: Signal identifiers in signal list are not distinct: releasereqind appears twice
51. warning [2.1.1] line 4980: Signal identifiers in signal list are not distinct: releasereqind appears twice
52. warning [2.1.1] line 4991: Signal identifiers in signal list are not distinct: picresume appears twice
53. warning [2.1.1] line 4991: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
54. warning [2.1.1] line 672: Signal identifiers in signal list are not distinct: releasereqind appears twice
55. warning [2.1.1] line 672: Signal identifiers in signal list are not distinct: releasereqind appears twice
56. warning [2.1.1] line 696: Signal identifiers in signal list are not distinct: releasereq appears twice
57. warning [2.1.1] line 696: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
58. warning [2.1.1] line 708: Signal identifiers in signal list are not distinct: releasereq appears twice
59. warning [2.1.1] line 708: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
60. warning [2.1.1] line 742: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
61. warning [2.1.1] line 742: Signal identifiers in signal list are not distinct: releasereq appears twice
62. warning [2.1.1] line 753: Signal identifiers in signal list are not distinct: releasereqind appears twice
63. warning [2.1.1] line 753: Signal identifiers in signal list are not distinct: releasereqind appears twice
64. warning [2.1.1] line 7543: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
65. warning [2.1.1] line 7543: Signal identifiers in signal list are not distinct: picresume appears twice
66. warning [2.1.1] line 924: Signal identifiers in signal list are not distinct: releasereqind appears twice
67. warning [2.1.1] line 925: Signal identifiers in signal list are not distinct: releasereqind appears twice

68. warning [2.1.1] line 926: Signal identifiers in signal list are not distinct: releasereqind appears twice
69. warning [2.1.1] line 927: Signal identifiers in signal list are not distinct: releasereqind appears twice
70. warning [2.1.1] line 946: Signal identifiers in signal list are not distinct: servicefeatureind appears twice
71. warning [2.1.1] line 946: Signal identifiers in signal list are not distinct: releasereq appears twice
72. warning [2.1.1] line 968: Signal identifiers in signal list are not distinct: picresume appears twice
73. warning [2.1.1] line 968: Signal identifiers in signal list are not distinct: dpdisconnect appears twice
74. warning [4.1.11] line 1222: Redeclaration of variable, parameter or synonym csaid
75. warning [4.1.11] line 1299: Redeclaration of variable, parameter or synonym csaid
76. warning [4.1.11] line 1339: Redeclaration of variable, parameter or synonym csaid
77. warning [4.1.11] line 1339: Redeclaration of variable, parameter or synonym csa
78. warning [4.1.11] line 1435: Redeclaration of variable, parameter or synonym csa
79. warning [4.1.11] line 1435: Redeclaration of variable, parameter or synonym csaid
80. warning [4.1.11] line 14444: Redeclaration of variable, parameter or synonym legid
81. warning [4.1.11] line 14445: Redeclaration of variable, parameter or synonym exporteventrecord
82. warning [4.1.11] line 14458: Redeclaration of variable, parameter or synonym servicekey
83. warning [4.1.11] line 14530: Redeclaration of variable, parameter or synonym legid
84. warning [4.1.11] line 14531: Redeclaration of variable, parameter or synonym importeventrecord
85. warning [4.1.11] line 14544: Redeclaration of variable, parameter or synonym servicekey
86. warning [4.1.11] line 14609: Redeclaration of variable, parameter or synonym dlarg
87. warning [4.1.11] line 14682: Redeclaration of variable, parameter or synonym ocarg
88. warning [4.1.11] line 14734: Redeclaration of variable, parameter or synonym rarg
89. warning [4.1.11] line 14758: Redeclaration of variable, parameter or synonym slarg
90. warning [4.1.11] line 1484: Redeclaration of variable, parameter or synonym csa
91. warning [4.1.11] line 1519: Redeclaration of variable, parameter or synonym csa
92. warning [4.1.11] line 1560: Redeclaration of variable, parameter or synonym bcsmid
93. warning [4.1.11] line 1561: Redeclaration of variable, parameter or synonym csa
94. warning [4.1.11] line 1603: Redeclaration of variable, parameter or synonym csa
95. warning [4.1.11] line 1603: Redeclaration of variable, parameter or synonym bcsmid
96. warning [4.1.11] line 18128: Redeclaration of variable, parameter or synonym legid
97. warning [4.1.11] line 18187: Redeclaration of variable, parameter or synonym leg
98. warning [4.1.11] line 18188: Redeclaration of variable, parameter or synonym legid
99. warning [4.1.11] line 18261: Redeclaration of variable, parameter or synonym leg
100. warning [4.1.11] line 18261: Redeclaration of variable, parameter or synonym legid
101. warning [4.1.11] line 18337: Redeclaration of variable, parameter or synonym dp

102. warning [4.1.11] line 18338: Redeclaration of variable, parameter or synonym legid
103. warning [4.1.11] line 18339: Redeclaration of variable, parameter or synonym party
104. warning [4.1.11] line 18670: Redeclaration of variable, parameter or synonym legid
105. warning [4.1.11] line 20068: Redeclaration of variable, parameter or synonym leg
106. warning [4.1.11] line 20068: Redeclaration of variable, parameter or synonym legid
107. warning [4.1.11] line 20080: Redeclaration of variable, parameter or synonym csid
108. warning [4.1.11] line 20124: Redeclaration of variable, parameter or synonym legid
109. warning [4.1.11] line 20125: Redeclaration of variable, parameter or synonym leg
110. warning [4.1.11] line 20126: Redeclaration of variable, parameter or synonym csid
111. warning [4.1.11] line 20169: Redeclaration of variable, parameter or synonym legid
112. warning [4.1.11] line 20204: Redeclaration of variable, parameter or synonym legid
113. warning [4.1.11] line 20205: Redeclaration of variable, parameter or synonym leg
114. warning [4.1.11] line 20288: Redeclaration of variable, parameter or synonym csid
115. warning [4.1.11] line 20347: Redeclaration of variable, parameter or synonym cs
116. warning [4.1.11] line 20347: Redeclaration of variable, parameter or synonym csid
117. warning [4.1.11] line 20373: Redeclaration of variable, parameter or synonym cs
118. warning [4.1.11] line 20374: Redeclaration of variable, parameter or synonym csid
119. warning [4.1.11] line 20400: Redeclaration of variable, parameter or synonym csid
120. warning [4.1.11] line 3281: Redeclaration of variable, parameter or synonym csid
121. warning [4.1.11] line 3304: Redeclaration of variable, parameter or synonym csid
122. warning [4.1.11] line 3339: Redeclaration of variable, parameter or synonym csid
123. warning [4.1.11] line 3426: Redeclaration of variable, parameter or synonym csid
124. warning [4.1.11] line 3477: Redeclaration of variable, parameter or synonym legid
125. warning [4.1.11] line 3478: Redeclaration of variable, parameter or synonym csid
126. warning [4.1.11] line 3501: Redeclaration of variable, parameter or synonym csid
127. warning [4.1.11] line 3501: Redeclaration of variable, parameter or synonym legid
128. warning [4.1.11] line 3571: Redeclaration of variable, parameter or synonym legid
129. warning [4.1.11] line 5192: Redeclaration of variable, parameter or synonym legid
130. warning [4.1.11] line 5230: Redeclaration of variable, parameter or synonym legid
131. warning [4.1.11] line 5273: Redeclaration of variable, parameter or synonym legid
132. warning [4.1.11] line 5311: Redeclaration of variable, parameter or synonym legid
133. warning [4.1.11] line 5371: Redeclaration of variable, parameter or synonym legid
134. warning [4.1.11] line 5422: Redeclaration of variable, parameter or synonym legid
135. warning [4.1.11] line 5509: Redeclaration of variable, parameter or synonym legid

136. warning [4.1.11] line 5557: Redeclaration of variable, parameter or synonym legid
137. warning [4.1.11] line 5660: Redeclaration of variable, parameter or synonym legid
138. warning [4.1.11] line 7784: Redeclaration of variable, parameter or synonym legid
139. warning [4.1.11] line 7785: Redeclaration of variable, parameter or synonym servicekey
140. warning [4.1.11] line 7901: Redeclaration of variable, parameter or synonym legid
141. warning [4.1.11] line 7903: Redeclaration of variable, parameter or synonym servicekey
142. warning [4.1.11] line 7955: Redeclaration of variable, parameter or synonym legid
143. warning [4.1.11] line 7957: Redeclaration of variable, parameter or synonym servicekey
144. warning [4.1.11] line 8064: Redeclaration of variable, parameter or synonym legid
145. warning [4.1.11] line 8065: Redeclaration of variable, parameter or synonym eventtypebcsm
146. warning [4.1.11] line 8148: Redeclaration of variable, parameter or synonym legid
147. warning [4.1.11] line 8162: Redeclaration of variable, parameter or synonym servicekey
148. warning [4.1.11] line 8226: Redeclaration of variable, parameter or synonym legid
149. warning [4.1.11] line 8227: Redeclaration of variable, parameter or synonym eventtypebcsm
150. warning [4.1.11] line 8332: Redeclaration of variable, parameter or synonym cirarg
151. warning [4.1.11] line 8417: Redeclaration of variable, parameter or synonym legid
152. warning [4.1.11] line 8418: Redeclaration of variable, parameter or synonym servicekey
153. warning [4.1.11] line 8481: Redeclaration of variable, parameter or synonym legid
154. warning [4.1.11] line 8540: Redeclaration of variable, parameter or synonym legid
155. warning [4.1.11] line 8541: Redeclaration of variable, parameter or synonym eventtypebcsm
156. warning [4.1.11] line 8542: Redeclaration of variable, parameter or synonym servicekey
157. warning [4.1.11] line 8601: Redeclaration of variable, parameter or synonym legid
158. warning [4.1.11] line 8603: Redeclaration of variable, parameter or synonym servicekey
159. warning [4.1.11] line 8662: Redeclaration of variable, parameter or synonym legid
160. warning [4.1.11] line 8663: Redeclaration of variable, parameter or synonym eventtypebcsm
161. warning [4.1.11] line 8664: Redeclaration of variable, parameter or synonym servicekey
162. warning [4.1.11] line 8703: Redeclaration of variable, parameter or synonym icaarg
163. warning [4.1.11] line 8742: Redeclaration of variable, parameter or synonym rncearg
164. warning [4.1.11] line 9041: Redeclaration of variable, parameter or synonym coarg
165. warning [4.1.11] line 9112: Redeclaration of variable, parameter or synonym ciarg
166. warning [4.1.11] line 9164: Redeclaration of variable, parameter or synonym ctarg
167. warning [4.1.11] line 9199: Redeclaration of variable, parameter or synonym sfarg
168. warning [4.1.11] line 9251: Redeclaration of variable, parameter or synonym srarg
169. warning [4.1.11] line 9286: Redeclaration of variable, parameter or synonym rcarg

Annex C: Experiment 3

C.1 Description

SDL model of INAP created with SDT was converted into PR and imported back into SDT. The motivation for performing such an experiment was to try out SDT capabilities of converting complex object-oriented description in PR format.

C.2 Steps performed

1. PR representation of INAP was generated using SDT tool.
2. PR representation was converted into a set of SDT graphical files which were imported into SDT.
3. SDT Analyser error report (appendix C.I) was analysed.
4. Graphical contents was analysed.

C.3 Observations

1. There was no problem to create the full set of SDT graphical files.
2. Import function failed at first reporting that some SDT file names were to long. After shortening some names, the process was restarted.
3. Import function of SDT easily collected the whole model automatically, recreating original system structure and connecting each SDL entity to appropriate SDT graphical file. However, inexperienced users may find it a problem to specify which SDT file to take as the starting node for import.
4. Analyser reported a number of problems which all have the same origin. When SDT creates a PR file it creates joins and labels with numbering that is unique on the process level. This means that different process type definitions contain same labels, which is not a problem, but it also means that process type definitions of matching sub and super types contain same labels. Since tidy up routines do not seem to recombine join-label pairs specialized process types end up having labels that are not unique. This situation does not occur in SDL88, but can occur when SDL92 is used.
5. The following can be said about graphical layout of imported diagrams:
   - process graphs are in principle OK;
   - gates are all in place (including dashed gates);
   - all text is placed in one rather narrow but long text symbol that spans across several pages. In many situations this will require manual cut & paste effort to clean this up;
   - type reference symbols are well placed;
   - interaction diagrams range from quite tidy less complex ones, to less tidy more complex ones. In every case all elements are there, correctly converted and visible. Dashed block and process symbols are correctly derived from channel and signalroute definitions and gates are well connected to appropriate gates and signalroutes.

The upcoming use of CIF should help to resolve remaining problems of graphical layout.

C.4 Conclusions

1. With exception of multiple label problem described in observation 3. SDT is able to read in complex object - oriented models in PR form and convert them successfully into its native SDL graphical format. It would be useful to replace a two phased conversion activity into a fully automated one.

2. Problem of long names should also be resolved.

Appendix C.I

Report of semantic analysis performed on the graphical sdt files created as inport of .pr file generated from original inap specification.

~

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(1),182(30,100),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(2),341(80,175),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(3),365(30,25),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(2),413(130,175),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),377(30,190),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),383(55,190),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),404(105,190),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),410(155,190),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(2),416(55,40),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(2),422(30,55),1)

ERROR 166 Definition of Lbl7 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(2),464(80,100),1)

ERROR 166 Definition of Lbl8 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(1),287(30,190),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(1),293(130,190),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(1),317(155,190),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(2),329(5,40),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(4),905(55,190),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(1),317(55,160),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(1),341(80,160),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(1),380(155,160),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(2),398(5,40),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(2),578(30,160),1)

ERROR 166 Definition of Lbl5 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(2),629(155,160),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(3),653(30,25),1)

ERROR 166 Definition of Lbl7 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(4),1070(30,190),1)

ERROR 166 Definition of Lbl8 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(4),1076(55,190),1)

ERROR 166 Definition of Lbl9 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(4),1103(130,190),1)

ERROR 166 Definition of Lbl10 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(5),1109(30,25),1)

ERROR 166 Definition of Lbl11 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(5),1286(130,175),1)

ERROR 166 Definition of Lbl13 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(5),1298(155,175),1)

ERROR 166 Definition of Lbl14 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1565(80,190),1)

ERROR 166 Definition of Lbl19 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1463(30,160),1)

ERROR 166 Definition of Lbl16 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1505(105,160),1)

ERROR 166 Definition of Lbl17 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1586(130,190),1)

ERROR 166 Definition of Lbl20 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(1),224(80,160),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(2),347(80,160),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(2),371(130,160),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(3),545(80,145),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(3),551(80,160),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(3),557(105,145),1)

ERROR 166 Definition of Lbl5 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(5),953(30,190),1)

ERROR 166 Definition of Lbl9 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(5),863(55,100),1)

ERROR 166 Definition of Lbl7 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(5),911(105,100),1)

ERROR 166 Definition of Lbl8 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(6),1061(30,190),1)

ERROR 166 Definition of Lbl10 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(1),182(30,100),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(2),341(80,175),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(3),365(30,25),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/ssf_fsm1.spt(2),413(130,175),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),377(30,190),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),383(55,190),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),404(105,190),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(1),410(155,190),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(2),416(55,40),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(2),422(30,55),1)

ERROR 166 Definition of Lbl7 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/interfacehandler1.spt(2),464(80,100),1)

ERROR 166 Definition of Lbl8 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(1),287(30,190),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(1),293(130,190),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(1),317(155,190),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(2),329(5,40),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/terminatingbcsm1.spt(4),905(55,190),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(1),317(55,160),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(1),341(80,160),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(1),380(155,160),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(2),398(5,40),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(2),578(30,160),1)

ERROR 166 Definition of Lbl5 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(2),629(155,160),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(3),653(30,25),1)

ERROR 166 Definition of Lbl7 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(4),1070(30,190),1)

ERROR 166 Definition of Lbl8 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(4),1076(55,190),1)

ERROR 166 Definition of Lbl9 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(4),1103(130,190),1)

ERROR 166 Definition of Lbl10 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(5),1109(30,25),1)

ERROR 166 Definition of Lbl11 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(5),1286(130,175),1)

ERROR 166 Definition of Lbl13 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(5),1298(155,175),1)

ERROR 166 Definition of Lbl14 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1565(80,190),1)

ERROR 166 Definition of Lbl19 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1463(30,160),1)

ERROR 166 Definition of Lbl16 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1505(105,160),1)

ERROR 166 Definition of Lbl17 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegment1.spt(6),1586(130,190),1)

ERROR 166 Definition of Lbl20 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(1),224(80,160),1)

ERROR 166 Definition of Lbl1 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(2),347(80,160),1)

ERROR 166 Definition of Lbl2 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(2),371(130,160),1)

ERROR 166 Definition of Lbl3 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(3),545(80,145),1)

ERROR 166 Definition of Lbl4 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(3),551(80,160),1)

ERROR 166 Definition of Lbl6 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(3),557(105,145),1)

ERROR 166 Definition of Lbl5 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(5),953(30,190),1)

ERROR 166 Definition of Lbl9 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(5),863(55,100),1)

ERROR 166 Definition of Lbl7 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(5),911(105,100),1)

ERROR 166 Definition of Lbl8 exists already in super type

#SDTREF(SDL,/pt/pt65/zoric/inap0/callsegmentassociation1.spt(6),1061(30,190),1)

ERROR 166 Definition of Lbl10 exists already in super type

Semantic analysis completed

Number of errors: 86

WARNING 278 Analyser command could not be fully performed

+ Analysis completed

Annex D:
Experiment 4

D.1 Description

SDL model of INRES protocol that uses SDL88 created with SDT was converted into PR and imported into ObjectGEODE.

D.2 Steps performed

1. PR representation of INRES was generated using SDT tool.
2. PR representation of INRES was read into Geodedit.
3. Geodecheck error report (appendix D.I) was analysed.
4. Graphical contents was analysed.

D.3 Observations

1. Errors reported are caused by use of = (equality) operator on the variables of type defined to have only literals 0 and 1. According to ITU-T Recommendation Z.100 [2] every type by default has operators of equality and nonequality (= and =/). It appears that ObjectGEODE does not support that.
2. Graphical layout of diagrams is basically OK.

D.4 Conclusions

1. Lack of support for predefined operators of equality and nonequality is not in accordance with ITU-T Recommendation Z.100 [2].

Appendix D.I

Geodecheck error report from analysis of INRES protocol using SDL88.

"inres0.pr", error [5.4.3] line 197: Literal incompatible with type sequencenumber

"inres0.pr", error [5.4.3] line 175: Literal incompatible with type sequencenumber

"inres0.pr", error [5.4.3] line 375: Literal incompatible with type sequencenumber

"inres0.pr", error [5.4.3] line 362: Literal incompatible with type sequencenumber

"inres0.pr", (3 information)

"inres0.pr", 0 warning

"inres0.pr", 4 errors

Annex E:
Experiment 5

E.1 Description

SDL model of INAP created with SDT was converted into PR and imported into Geodedit. The PR file saved by Geodedit was imported back into SDT.

E.2 Steps performed

1. PR representation of INAP was generated using SDT tool.
2. PR representation was manually edited to remove referenced definitions and qualifiers and imported into SDT.
3. The PR file saved by Geodedit was imported back into SDT.
3. SDT Analyser error report was analysed.
4. Graphical contents was analysed.

E.3 Observations

1. There was no problem to create the full set of SDT graphical files.
2. Import function of SDT could not collect the whole model automatically. All parts of the model were collected and visible in SDT organizer, but not connected to SDT graphical files. At this point a user may have problems to recognize which files to connect to which SDL entity. Following this all headers had to be updated, which is an automated function in SDT. Only after successful completion of these tasks the model could be analysed.
3. Analyser reported the same problems as in experiment 3.
4. Graphical layout of diagrams is also described in experiment 3.
5. The difference at process level is that current version of SDT takes CIF as comments, so that process diagrams are stuffed with comments that contain CIF.
6. As could be expected after experiments previously performed, block and process interaction diagrams are the same as before, but gate names are not there, because they were removed by Geode (removal of VIA *gatename* constructs from channel and signalroute definitions).

E.4 Conclusions

1. PR representations of INAP SDL models saved by SDT and Geode have different structure, both in accordance with ITU-T Recommendation Z.100 [2]. SDT is able to read in both representations equally.
2. Import of PR files into SDT can be simple for experienced users, but may create problems for less experienced ones.
3. Loss of information about gates caused by inadequate handling of these constructs by ObjectGEODE was clearly demonstrated in this experiment.

History

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