

**Methods for Testing and Specification (MTS);
The Testing and Test Control Notation version 3;
Part 2: TTCN-3 Tabular presentation Format (TFT)**



Reference

RES/MTS-00063-2 [2]

Keywords

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 2 of a multi-part deliverable covering the Testing and Test Control Notation version 3, as identified below:

- Part 1: "TTCN-3 Core Language";
- Part 2: "TTCN-3 Tabular presentation Format (TFT)";**
- Part 3: "TTCN-3 Graphical presentation Format (GFT)";
- Part 4: "TTCN-3 Operational Semantics".

1 Scope

The present document defines the tabular presentation format of TTCN Version 3 (or TTCN-3). The present document is based on the TTCN-3 core language defined in ES 201 873-1 [1].

The specification of other formats is outside the scope of the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ETSI ES 201 873-1 (V2.2.0): "Methods for Testing and Specification (MTS); Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

3 Abbreviations

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

ASN.1	Abstract Syntax Notation One
ATS	Abstract Test Suite
BNF	Backus-Nauer Form
MTC	Master Test Component
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TFT	Tabular presentation Format for TTCN-3
TTCN	Testing and Test Control Notation

4 Introduction

The Tabular presentation Format for TTCN-3 (TFT) is a graphical format that is similar in appearance and functionality to earlier versions of TTCN, which are conformance testing oriented. The core language of TTCN-3 is defined in ES 201 873-1 [1] and provides a full text-based syntax, static semantics as well as defining the use of the language with ASN.1. The tabular format provides an alternative way of displaying the core language as well as emphasizing those aspects that are particular to the requirements of a standardized conformance test suite.

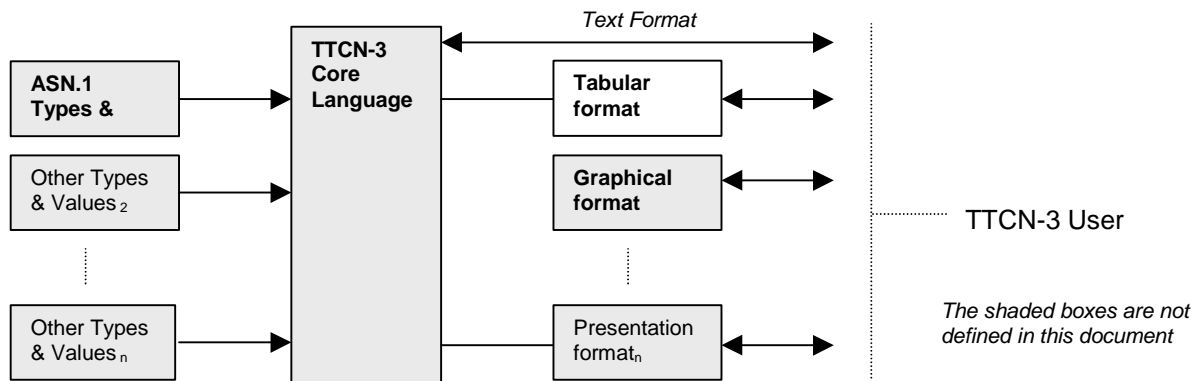


Figure 1: User's view of the core language and the various presentation formats

The core language may be used independently of the tabular presentation format. However, the tabular format cannot be used without the core language. Use and implementation of the tabular presentation format shall be done on the basis of the core language.

The present document defines the:

- a) proformas;
- b) syntax mappings;
- c) additional static semantics;
- d) operational semantic restrictions;
- e) display and other attributes.

Together these characteristics form the tabular presentation format.

5 Conventions

This clause defines the conventions, which have been used when defining the TTCN proformas and the TTCN core language grammar.

5.1 Syntactic metanotation

Table 1 defines the metanotation used to specify the extended BNF grammar for TTCN (henceforth called BNF).

Table 1: The TTCN.MP syntactic metanotation

::=	is defined to be
abc xyz	abc followed by xyz
	alternative
[abc]	0 or 1 instances of abc
{abc}	0 or more instances of abc
{abc}+	1 or more instances of abc
(...)	textual grouping
abc	the non-terminal symbol abc
abc	a terminal symbol abc
"abc"	a terminal symbol abc

The BNF productions are defined in clause 7 of the present document. Productions that are not defined in clause 7 can be found in annex A of ES 201 873-1 [1].

5.2 Specification text

- Bold text** shall be used for references to proforma fields.
- Italics text* shall be used for references to the TTCN-3 core language BNF productions.
- Bold courier new** text shall be used for core language keywords.

5.3 Proformas

- Bold text** shall appear verbatim in each actual table in a TTCN-3 module.
- Italics text* shall not appear verbatim in a TTCN-3 module. This font is used to indicate that actual text shall be substituted for the italicised symbol. Syntax requirements for the actual text can be found either following the definition of the proforma or in the TTCN-3 core language BNF. Square brackets before and after the *Italics text* indicates that inclusion of the text into the given field of the proforma is optional.

5.4 Core language

- Bold text** is used for reserved keywords in the core language.
- Italics text* shall not appear verbatim in a TTCN-3 module. This font is used to indicate that actual text shall be substituted for the italicised symbol. Syntax requirements for the actual text can be found either following the definition of the proforma or in the TTCN-3 core language BNF.
- The "... " notation is a place holder for any arbitrary contents that is not explicitly shown.

5.5 General mapping rules

The mapping between the tabular presentation format and the TTCN-3 core language consists of a set of transformations. For every syntactical element within each proforma there is an associated transformation. The transformations make it also possible to transform any core language module into a tabular representation.

These transformations fall into two classes. The first class directly converts between a tabular element and a core language construct with the same meaning. The second class converts between a tabular element and an associated core language construct, which has no meaning at the core language level.

A typical example for the first class of transformations would be an identifier field. This field can be directly transformed from tabular to the core language and retains its meaning i.e. identifying some language element.

The second class of transformations is typically some form of comment or directive as to how a language element should be displayed in the presentation format. These elements have no direct meaning in the core language and are expressed using the *WithStatement*.

The syntax and semantics specified in the present document are specific to the ETSI tabular presentation format. In order to unambiguously identify within the core language which presentation format is being used the following special display statement shall be specified as the first display statement associated with the TTCN-3 core language module:

```

1:  module TTCN3ModuleId[ModuleParList] {
2:    ...
3:  } with {
4:    display "presentation format ETSI Tabular v1.0";
5:    ...
6:  }

```

NOTE: All *WithStatements* associated with a given proforma should be grouped together in a contiguous list.

The **Group** fields in the proformas are never translated into *WithStatements* but are derived from the actual group structure of the module specification.

6 Proformas

6.1 Test suite control

Test suite control			
Name	<i>TTCN3ModuleId</i>		
Version	<i>[TabFreeText]</i>		
Date	<i>[TabFreeText]</i>		
Base Standard Ref	<i>[TabFreeText]</i>		
Test Standard Ref	<i>[TabFreeText]</i>		
PICS Ref	<i>[TabFreeText]</i>		
PIXIT Ref	<i>[TabFreeText]</i>		
Test Method(s)	<i>[TabFreeText]</i>		
Encoding	<i>[TabFreeText]</i>		
Comments	<i>[TabFreeText]</i>		
Name	Type	Initial value	Comments
<i>[VarConstOrTimerIdentifier]</i>	<i>[ConstTypeOrTimer]</i>	<i>[Expression]</i>	<i>[TabFreeText]</i>
...
Behaviour			
<i>ModuleControlBody</i>			
Detailed comments	<i>[TabFreeText]</i>		

Figure 2: Test suite control proforma

6.1.1 Mapping

The Test Suite Control proforma is translated into three parts. The first part consists of the header fields and the **Detailed Comments** field, except the **Name** field, which are converted to display attributes within the *WithStatement* associated with the overall TTCN-3 module.

The second part are the local constants, variables and timers defined in the control part. These definitions can occur anywhere in the control part of the core language, but for the proforma they are separated from the rest of the behaviour and displayed in a separate table. The order of their definition shall be preserved, since the definitions can depend on each other. The **Type** column shall be set to the keyword **timer** for all timers and to the constant type preceded by the keyword **const** for all constants. The **Comments** fields of the local definitions table are converted to display attributes within the *WithStatement* associated with the control part of the TTCN-3 core module.

The third part is the control part of the TTCN-3 core language module minus the local constants, variables and timers.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      control {
3:          ModuleControlBody
4:      } with {
5:          { ModuleControlCommentsAttribute }
6:      }
7:  } with {
8:      ModuleControlAttributes
9:  }

```

EXAMPLE:

Test suite control			
Name	Example1		
Version	1.01		
Date	19 July 2001		
Base Standards Ref	ITU-T Recommendation Q.123		
Test Standards Ref	ITU-T Recommendation Q.123.1		
PICS Ref	ITU-T Recommendation Q.123.2, annex A		
PIXIT Ref	ITU-T Recommendation Q.123.2, annex B		
Test Method(s)	local		
Encoding	ISO/IEC 8825-1: 1993		
Comments	ATS written by STF 133		
Name	Type	Initial value	Comments
PI	const float	3.14	the ratio
x	float	PI * 2	double PI
t1	timer	15	a 15 second timer
Behaviour			
<pre> /* group1/ */ /* group1_1/ */ execute(test1); execute(test2); /* group1_2/ */ execute(test3); execute(test4); /* group2/ */ execute(test5); </pre>			
Detailed comments	detailed comments		

Maps to:

```

1: module Example1 {
2:   control {
3:     const float PI := 3.14;
4:     var float x := PI * 2;
5:     timer t1 := 15;
6:
7:     /* group1/ */
8:     /* group1_1/ */
9:     execute(test1());
10:    execute(test2());
11:    /* group1_2/ */
12:    execute(test3());
13:    execute(test4());
14:    /* group2/ */
15:    execute(test5());
16:  } with {
17:    display (PI) "control comments := the ratio";
18:    display (x) "control comments := double PI";
19:    display (t1) "control comments := a 15 second timer";
20:  }
21: } with {
22:   display "presentation format := ETSI Tabular v1.0";
23:   display "module version := 1.01";
24:   display "module date := 19 July 2001";
25:   display "module base standards ref := ITU-T Recommendation Q.123";
26:   display "module test standards ref := ITU-T Recommendation Q.123";
27:   display "module pics ref := ITU-T Recommendation Q.123 annex A";
28:   display "module pixit ref := ITU-T Recommendation Q.123 annex A";
29:   display "module test method := local";
30:   display "module encoding := ISO/IEC 8825-1: 1993";
31:   display "module comments := ATS written by STF 133";
32:   display "module detailed comments := detailed comments";
33: }

```

6.2 Test suite parameters

Test suite parameters				
Name	Type	Initial Value	PICS/PIXIT Ref	Comments
<i>ModuleParIdentifier</i>	<i>ModuleParType</i>	<i>[ConstantExpression]</i>	<i>[TabFreeText]</i>	<i>[TabFreeText]</i>
Detailed comments	<i>[TabFreeText]</i>			

Figure 3: Test suite parameters proforma

6.2.1 Mapping

All entries in the Test Suite Parameters proforma are mapped to the *ModuleParList* of the associated TTCN-3 module. The **PICS/PIXITref** and **Comments** fields are mapped to display attributes within the *WithStatements* associated with the overall TTCN-3 module.

```

1: module TTCN3ModuleId {
2:   [parameters {ModuleParList}
3:   with {
4:     [ModuleParPicsPixitRefAttribute;]
5:     [ModuleParComments;]
6:     [ModuleParDetailedComments;]]]
7:   ...
8: }

```

EXAMPLE:

Test suite parameters				
Name	Type	Initial Value	PICS/PIXIT Ref	Comments
CAP_1	boolean	true	A.1.3	option 1 implemented
Tall	float	600.0	A.1.4	overall module timer
Detailed comments	detailed comments			

Maps to:

```

1: module MyModule{
2:   parameters{ boolean CAP_1 := true, float Tall := 600.0 }
3:   with {
4:     display (CAP_1) "parameters pics/pixit ref := A.1.3";
5:     display (CAP_1) "parameters comments := option 1 implemented";
6:     display (Tall) "parameters pics/pixit ref := A.1.4";
7:     display (Tall) "parameters comments := overall module timer";
8:     display "parameters detailed comments := detailed comments"
9:   }

```

6.3 Module imports

Imports			
Source Name	<i>GlobalModuleId</i>		
Source Language	<i>[LanguageSpec]</i>		
Group	<i>[GroupReference]</i>		
Source Ref	<i>[TabFreeText]</i>		
Encoding	<i>[TabFreeText]</i>		
Comments	<i>[TabFreeText]</i>		
Type	Name	R	Comments
<i>ImportType</i>	<i>ImportIdentifier</i>	<i>Mark</i>	<i>[TabFreeText]</i>
Detailed comments	<i>[TabFreeText]</i>		

Figure 4: Imports proforma

6.3.1 Mapping

The Imports proforma is mapped to a *ImportDef* statement in the TTCN-3 core language. The **Source Name**, **Source Language**, **Type**, **Name** and **R** (recursive) fields are directly used in the corresponding core language *ImportDef* statement. The **Source Ref**, **Comments** and **Detailed Comments** fields are translated into display attributes within the *WithStatement* associated with the *ImportDef* statement. The **Encoding** field is translated into an encode attribute within the *WithStatement* associated with the *ImportDef* statement. The **Comments** field for each import is translated into a display attribute within the *WithStatement* associated with the *ImportDef* statement.

```

1: module TTCN3ModuleId[ModuleParList] {
2:
3:   import ImportType ImportIdentifier
4:   from GlobalModuleId
5:   [language FreeText]
6:   {
7:
8:
9:   } with {
10:    [ImportsSourceRefAttribute;]
11:    [ImportsSourceCommentsAttribute;]
12:    [ImportsSourceDefinitionCommentsAttribute;]
13:    [ImportsSourceDetailedCommentsAttribute;]

```

14:	[EncodeAttribute;]
15:	}
	}

EXAMPLE:

Imports			
Source Name	ModuleA		
Source Language	ASN.1:1997		
Group	Imports1/		
Source Ref	EN 800 900 version 2		
Encoding	BER		
Comments	importing declarations from an existing ATS		
Type	Name	R	Comments
constant	all		
Type	MyType	*	(1)
Group	AtoU_CTR		
Detailed comments	(1) Asterisk indicates: import recursively what is needed for MyType definition		

Maps to:

```

1: module MyModule {
2:
3:   import from ModuleA language "ASN.1997"
4:   {
5:     all const;
6:     type MyType;
7:
8:     group AtoU_CTR
9:   } with {
10:    display "imports source ref := EN 800 900 version 2";
11:    display "imports comments := importing declarations from ATS";
12:    display (type MyType) "imports definitions comments := (1)";
13:    display "imports detailed comments := (1) import non-
14: recursively";
15:    encode "BER";
   }
}

```

6.4 Simple types

Simple types			
Group	[GroupReference]		
Name	Definition	Encoding	Comments
SubTypeIdentifier	Type [ArrayDef] [SubTypeSpec]	[TabFreeText]	[TabFreeText]
Detailed comments	[TabFreeText]		

Figure 5: Simple types proforma

6.4.1 Mapping

The Simple Types proforma is mapped to a TTCN-3 group containing a series of simple type definition statements. Simple type definitions are all *SubTypeDef* type definitions.

The **Detailed Comments** field is mapped to a display attribute within the *WithStatement* associated with the enclosing group. The **Encoding** and **Comments** fields are mapped to encoding and display attributes respectively within the *WithStatement* associated with the respective simple type definition. If the simple type definition statements are not enclosed in a group, a new group shall be created named **SimpleTypes** with a unique number appended when necessary to make the group name unique.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      group SimpleTypesN {
3:          type Type SubTypeIdentifier [ArrayDef] [SubTypeSpec] with {
4:              [EncodeAttribute;]
5:              [CommentsAttribute;]
6:          }
7:      } with {
8:          [SimpleTypesDetailedCommentsAttribute;]
9:      }
10: }

```

EXAMPLE:

Simple types			
Group	SimpleTypes1/		
Name	Definition	Encoding	Comments
EQ_NUMBER	integer (1 .. 20)	PER	God knows
Detailed comments	detailed comments		

Maps to:

```

1:  module MyModule {
2:      group SimpleTypes1 {
3:          type integer EQ_NUMBER (1..20) with {
4:              encode "PER";
5:              display "comments := God knows";
6:          }
7:      } with {
8:          display "simple types detailed comments := detailed comments";
9:      }
10: }

```

6.5 Structured types

Structured type			
Name	<i>StructTypeIdentifier</i> [<i>StructDefFormalParList</i>]		
Group	<i>[GroupReference]</i>		
Structure	<i>StructureType</i>		
Encoding	<i>[TabFreeText]</i>		
Comments	<i>[TabFreeText]</i>		
Element name	Type definition	Field encoding	Comments
<i>FieldIdentifier</i>	<i>Type</i> [<i>SubTypeSpec</i>] <i>[OptionalKeyword]</i>	<i>[TabFreeText]</i>	<i>[TabFreeText]</i>
Detailed comments	<i>[TabFreeText]</i>		

Figure 6: Structured type proforma

6.5.1 Mapping

The Structured Type proforma is mapped to a structured type definition statement in TTCN-3. The following types will use this proforma: *RecordDef*, *UnionDef* and *SetDef*.

The **Comments** and **Detailed Comments** fields are mapped to display attributes in the corresponding *WithStatement*, and the **Encoding** field is mapped to an encode attribute in the corresponding *WithStatement*. The **Comments** fields of each field element are mapped to display attributes qualified by the *FieldIdentifier* in the corresponding *WithStatement*.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      type StructureType StructTypeIdentifier [StructDefFormalParList] {
3:          {Type FieldIdentifier [ArrayDef] [SubtypeSpec] [OptionalKeyword]}
4:      } with {
5:          [EncodeAttribute;]
6:          [CommentsAttribute;]
7:          {FieldCommentsAttribute;}
8:          {FieldEncodeAttribute;}
9:          [DetailedCommentsAttribute;]
10:     }
11: }

```

EXAMPLE:

Structured Type			
Name	routing_label(SLSel_Type)		
Group			
Structure	record		
Encoding	BER		
Comments	header for routing info		
Element Name	Type Definition	Field Encoding	Comments
DestPC	BIT_14		destination point code
OrigPC	BIT_14		origination point code
SLSel	SLSel_Type	PER	signalling link selection
Detailed Comments	overrides previous definitions		

Maps to:

```

1:  module MyModule {
2:      type record routing_label(SLSel_Type) {
3:          BIT_14 DestPC,
4:          BIT_14 OrigPC,
5:          SLSel_Type SLSel
6:      } with {
7:          encode "BER";
8:          display "comments" := header for routing info";
9:          display (DestPC) "comments" := destination point code";
10:         display (OrigPC) "comments" := origination point code";
11:         display (SLSel) "comments" := signalling link selection";
12:         encode (SLSel) "PER";
13:         display "detailed comments" := overrides previous definition";
14:     }
15: }

```

6.6 SequenceOf Types

SequenceOf Types					
Group	[GroupReference]				
Name	Type	Kind	Length	Encoding	Comments
StructTypeIdentifier	Type [SubTypeSpec]	RecordOrSet	[StringLength]	[TabFreeText]	[TabFreeText]
Detailed Comments	[TabFreeText]				

Figure 7: SequenceOf Types Proforma

6.6.1 Mapping

The SequenceOf Types proforma is mapped to a TTCN-3 group containing a series of sequenceof type definition statements. This proforma shall be used for *RecordOfDef* and *SetOfDef* type definitions.

The **Detailed Comments** field is mapped to a display attribute within the *WithStatement* associated with the enclosing group. The **Encoding** and **Comments** fields are mapped to encoding and display attributes respectively within the *WithStatement* associated with the respective sequence of type definition. If the sequenceof type definition statements are not enclosed in a group, a new group shall be created named **SequenceOfTypes** with a unique number appended when necessary to make the group name unique.

```

1: module TTCN3ModuleId[ModuleParList] {
2:   group SequenceOfTypesN {
3:     type record of [StringLength] Type StructTypeIdentifier [SubTypeSpec]
4:       with {
5:         [EncodeAttribute;]
6:         [CommentsAttribute;]
7:       }
8:     type set of [StringLength] Type StructTypeIdentifier [SubTypeSpec]
9:       with {
10:        [EncodeAttribute;]
11:        [CommentsAttribute;]
12:      }
13:   } with {
14:     [SequenceOfTypesDetailedCommentsAttribute;]
15:   }
16: }

```

EXAMPLE:

SequenceOf Types					
Group	SequenceOfTypes1/				
Name	Type	Kind	Length	Encoding	Comments
RecordOfIntegers	integer(1..10)	record	10	BER	ten integers
SetOfBooleans	boolean	set	3	PER	three booleans
Detailed Comments	example sequenceof types				

Maps to:

```

1: module MyModule {
2:   group SequenceOfTypes1 {
3:     type record of length(10) integer RecordOfIntegers(1..10) with {
4:       encode "BER";
5:       display "comments := ten integers";
6:     }
7:     type set of length(3) boolean SetOfBooleans with {
8:       encode "PER";
9:       display "comments := three booleans";
10:    }
11:   } with {

```

```

12:     display "sequenceof types detailed comments := example
13: sequenceof types";
14:     }
15: }

```

6.7 Enumerated Type

Enumerated Type		
Name	<i>EnumTypeIdentifier</i>	
Group	[GroupReference]	
Encoding	[TabFreeText]	
Comments	[TabFreeText]	
	Name Value	Value
	<i>NamedValueIdentifier</i>	[Number]
		Comments
		[TabFreeText]
Detailed Comments	[TabFreeText]	

Figure 8: Enumerated Type Proforma

6.7.1 Mapping

The Enumerated Type proforma is mapped to an enumerated type definition statement in the TTCN-3 core language. The **Comments** and **Detailed Comments** fields are mapped to display attributes in the corresponding *WithStatement*, and the **Encoding** field mapped to an encode attribute within the corresponding *WithStatement*. The **Comments** fields of each named value are mapped to display attributes qualified by the *NamedValueIdentifier* in the corresponding *WithStatement*.

```

1: module TTCN3ModuleId[ModuleParList] {
2:   type enumerated EnumTypeIdentifier {
3:     NamedValueIdentifier [(Number)] {, NamedValueIdentifier [(Number)]}
4:   } with {
5:     [EncodeAttribute;]
6:     [CommentsAttribute;]
7:     [NamedValueCommentsAttribute;]
8:     [DetailedCommentsAttribute;]
9:   }
10: }

```

EXAMPLE:

Enumerated Type		
Name	Weekdays	
Group		
Encoding	BER	
Comments	days of the week	
	Name Value	Value
	Monday	1
	Tuesday	2
	Wednesday	3
	Thursday	4
	Friday	5
	Saturday	6
	Sunday	7
Detailed Comments	wish it were Friday	

Maps to:

```

1:  module MyModule {
2:      type enumerated Weekdays {
3:          Monday(1), Tuesday(2), Wednesday(3), Thursday(4), Friday(5),
4:          Saturday(6), Sunday(7)
5:      } with {
6:          encode "BER";
7:          display "comments := days of the week";
8:          display (Wednesday) "comments := half way there";
9:          display (Friday) "comments := TGIF";
10:         display "detailed comments := wish it were Friday";
11:     }
12: }

```

6.8 Port Types

Port Type		
Name	<i>PortTypeIdentifier</i>	
Group	<i>[GroupReference]</i>	
Communication Model	<i>PortModelType</i>	
Comments	<i>[TabFreeText]</i>	
Type/Signature	Direction	Comments
<i>TypeOrSignature</i>	<i>InOutOrInout</i>	<i>[TabFreeText]</i>
Detailed Comments	<i>[TabFreeText]</i>	

Figure 9: Port Type Proforma

6.8.1 Mapping

The Port Type proforma is mapped to a port type definition in the TTCN-3 core language. The **Comments** and **Detailed Comments** fields are mapped to display attributes in the corresponding *WithStatement*. The **Comments** fields of the types and signature table are mapped to display attributes in the corresponding *WithStatement* qualified by the type or signature identifier. There will always be one row for every type or signature.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      type port PortTypeIdentifier PortModelType {
3:          PortTypeDef
4:      } with {
5:          [CommentsAttribute;]
6:          {TypeOrSignatureCommentsAttribute;}
7:          [TypeOrSignatureCommentsAttribute;]
8:          [DetailedCommentsAttribute;]
9:      }
10: }

```

EXAMPLE:

Port Type		
Name	MyPortType	
Group		
Communication Model	message	
Comments	example port type	
Type/Signature	Direction	Comments
MsgType1	in	first comment
MsgType2	in	second comment
MsgType3	out	third comment
Detailed Comments	detailed comment	

Maps to:

```

1:  module MyModule {
2:      type port MyPortType message {
3:          in MsgType1;
4:          in MsgType2;
5:          out MsgType3;
6:      } with {
7:          display "comments := example port type";
8:          display (MsgType1) "comments := first comment";
9:          display (MsgType2) "comments := second comment";
10:         display (MsgType3) "comments := third comment";
11:         display "detailed comments := detailed comment";
12:     }
13: }

```

6.9 Component Types

Component Type			
Name	<i>ComponentTypeIdentifier</i>		
Group	<i>[GroupReference]</i>		
Comments	<i>[TabFreeText]</i>		
Name	Type	Initial Value	Comments
<i>[VarConstOrTimerIdentifier]</i>	<i>[TypeOrTimer]</i>	<i>[Expression]</i>	<i>[TabFreeText]</i>
Port Name	Port Type		Comments
<i>PortIdentifier</i>	<i>PortTypeIdentifier [ArrayDef]</i>		<i>[TabFreeText]</i>
Detailed Comments	<i>[TabFreeText]</i>		

Figure 10: Component Type Proforma

6.9.1 Mapping

The Component Type proforma is mapped to a component type definition in the TTCN-3 core language. The proforma is translated into three parts.

The first part consists of the header **Comments** and **Detailed Comments** fields, which are converted to a display attribute within the *WithStatement* associated with the component type definition.

The second part are the local constants, variables and timers defined in the component type. These definitions can occur anywhere in the component type definition of the core language, but for the proforma they are separated from the port instances and displayed in a separate table. The order of their definition shall be preserved, since the definitions can depend on each other. The **Type** column shall be set to the keyword **timer** for all timers and to the constant type preceded by the keyword **const** for all constants. There will always be one row for every constant, variable or timer. The **Comments** column of this table is converted to display attributes qualified by the local definition's identifier within the *WithStatement* associated with the component type definition.

The third part are the port instances defined in the component type. Any array definitions are appended to the port type. There will always be one row for every port instance. The **Comments** column of this table is converted to display attributes qualified by the *PortIdentifier* within the *WithStatement* associated with the component type definition.

```

1: module TTCN3ModuleId[ModuleParList] {
2:   type component ComponentTypeIdentifier {
3:     var Type VarIdentifier [:= ContantExpression];
4:     timer TimerIdentifier [:= ContantExpression];
5:     const Type ConstIdentifier := ConstantExpression;
6:
7:     PortList
8:   } with {
9:     [CommentsAttribute;]
10:    {PortCommentsAttribute;}
11:    [DetailedCommentsAttribute;]
12:  }
13: }

```

EXAMPLE:

Component Type			
Name	MyComponentType		
Group			
Comments	an example component type		
Name	Type	Initial Value	Comments
PI	const float	3.14	the ratio
x	float	PI * 2	double PI
t1	timer	15 min	a 15 second timer
Port Name	Port Type	Comments	
PC01	MyMessagePortType	first comment	
PC02	MyProcedurePortType	second comment	
Detailed Comments	detailed comments		

Maps to:

```

1: module MyModule {
2:   type component MyComponentType {
3:     const float PI := 3.14;
4:     var float x := PI * 2;
5:     timer t1 := 15;
6:     port MyMessagePortType PC01;
7:     port MyProcedurePortType PC02;
8:   } with {
9:     display "comments := an example component type";
10:    display (PI) "comments := the ratio";
11:    display (x) "comments := double PI";
12:    display (t1) "comments := a 15 second timer";
13:    display (PC01) "comments := first comment";
14:    display (PC02) "comments := second comment";
15:    display "detailed comments := detailed comments";
16:  }
17: }

```

6.10 Constants

Constants			
Group	[GroupReference]		
Name	Type	Value	Comments
ConstIdentifier	Type	ConstantExpression	[TabFreeText]
Detailed Comments	[TabFreeText]		

Figure 11: Constants Proforma

6.10.1 Mapping

The Constants proforma is mapped to a TTCN-3 group containing a series of constant and external constant definition statements. The **Detailed Comments** field is mapped to a display attribute within the *WithStatement* associated with the enclosing group. The **Comments** fields are mapped to display attributes within the *WithStatement* associated with the respective constant definition. If the constant definition statements are not enclosed in a group, a new group shall be created named **Constants** with a unique number appended when necessary to make the group name unique. For an external constant the **Value** field is set to the keyword **external**.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      group ConstantsN {
3:          const Type ConstIdentifier := ConstantExpression with {
4:              [CommentsAttribute;]
5:          }
6:          external const Type ConstIdentifier with {
7:              [CommentsAttribute;]
8:          }
9:      } with {
10:         [DetailedCommentsAttribute;]
11:     }
12: }

```

EXAMPLE:

Constants			
Group	Constants1		
Name	Type	Value	Comments
TOTO	integer	external	defined somewhere else
SEL2	boolean	(5 + TOTO) < 10	TOTO limit reached
T1	integer	15	
Detailed Comments	detailed comments		

Maps to:

```

1:  module MyModule {
2:      group Constants1 {
3:          external const integer TOTO with {
4:              display "comments := defined somewhere else";
5:          }
6:          const boolean SEL2 := (5 + TOTO) < 10 with {
7:              display "comments := TOTO limit reached";
8:          }
9:          const integer T1 := 15;
10:     } with {
11:         display "detailed comments := detailed comments";
12:     }
13: }

```

6.11 Signature

Signature Definition	
Name	<i>SignatureIdentifier</i> ([<i>SignatureFormalParList</i>])
Group	[<i>GroupReference</i>]
Return Type	[<i>Type</i>]
Comments	[<i>TabFreeText</i>]
	Exception Type
	[<i>ExceptionType</i>]
	Comments
	[<i>TabFreeText</i>]
Detailed Comments	[<i>TabFreeText</i>]

Figure 12: Signature Definition Proforma

6.11.1 Mapping

The Signature Definition proforma is mapped to a signature definition in the TTCN-3 core language. The **Comments** and **Detailed Comments** fields are mapped to display attributes within the corresponding *WithStatement*. The **Comments** fields of the exceptions table are mapped to display attributes qualified by an array reference with a running number, e.g. [0], [1], etc., in the corresponding *WithStatement*. The running number starts with zero and corresponds to the row position of the exception type in the exception type table. This solution is necessary, because the attribute qualifier must be an identifier otherwise and thus cannot be a reserved keyword like **integer**. Non-blocking procedures shall specify the keyword **noblock** as the return type.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      signature SignatureIdentifier([SignatureFormalParList])
3:          [return Type]
4:          [exception (ExceptionTypeList)]
5:      with {
6:          [CommentsAttribute;]
7:          [ExceptionCommentsAttribute;]
8:          [DetailedCommentsAttribute;]
9:      }
10: }

```

EXAMPLE:

Signature Definition	
Name	read(integer fildes, inout charstring buf, integer nbyte)
Group	
Return Type	integer
Comments	reads from a file
Exception Type	
integer	error code
MyException	user defined
Detailed Comments	required: unistd.h

Maps to:

```

1:  module MyModule {
2:      signature read_syscall(in integer fildes,
3:                             inout charstring buf,
4:                             in integer nbyte)
5:      return integer
6:      exception (integer)
7:      with {
8:          display "comments := reads from a file";
9:          display ([0]) "comments := error code of system call";
10:         display "detailed comments := required: unistd.h";
11:     }
12: }

```

6.12 Simple Templates

Simple Templates					
Group	[GroupReference]				
Name	Type	Derived	Value	Encoding	Comments
TemplateIdentifier	BaseTemplate	[DerivedDef]	TemplateBody	[TabFreeText]	[TabFreeText]
Detailed Comments	[TabFreeText]				

Figure 13: Simple Template Proforma

6.12.1 Mapping

The Simple Templates proforma is mapped to a TTCN-3 group containing a series of simple template definition statements. Simple template definitions are all template definitions that have a *SimpleSpec* or *ArrayValueOrAttrib* as the *TemplateBody*. The corresponding types are defined in a Simple Types, SequenceOf Type and Enumerated Type proforma.

The **Detailed Comments** field is mapped to a display attribute within the *WithStatement* associated with the enclosing group. The **Comments** and **Encoding** fields are mapped to display and encode attributes qualified by the *TemplateIdentifier* within the *WithStatement* associated with the respective simple template definition statement. If the simple template definition statements are not enclosed in a group, a new group shall be created named **SimpleTemplates** with a unique number appended when necessary to make the group name unique.

```

1: module TTCN3ModuleId[ModuleParList] {
2:   group SimpleTemplatesN {
3:     template BaseTemplate[DerivedDef] := TemplateBody with {
4:       [EncodeAttribute;]
5:       [CommentsAttribute;]
6:     }
7:   } with {
8:     [DetailedCommentsAttribute;]
9:   }
10: }

```

EXAMPLE:

Simple Templates					
Group	SimpleTemplates1				
Name	Type	Derived	Value	Encoding	Comments
MyTemplate1	MyType1		3	BER	foobar
MyTemplate11(integer index)	MyType1	MyTemplate1	3*index	PER	the current index
Detailed Comments	an example proforma				

Maps to:

```

1: module MyModule {
2:   group SimpleTemplates1 {
3:     template MyType1 MyTemplate1 with {
4:       encode "BER";
5:       display "comments := foobar";
6:     }
7:     template MyType1 MyTemplate11(integer index)
8:       modifies MyTemplate1 := 3 * index
9:     with {
10:      encode "PER";
11:      display "comments := the current index";
12:    }
13:   } with {
14:     display "detailed comments := an example proforma";
15:   }
16: }

```

6.13 Structured Template

Structured Template			
Name	<i>TemplateIdentifier</i> [<i>TemplateFormalParList</i>]		
Group	[<i>GroupReference</i>]		
Type/Signature	<i>TypeIdentifier</i> <i>SignatureIdentifier</i>		
Derived From	[<i>TemplateRef</i>]		
Encoding	[<i>TabFreeText</i>]		
Comments	[<i>TabFreeText</i>]		
Element Name	Element Value	Element Encoding	Comments
<i>FieldReference</i>	<i>FieldValueOrAttrib</i>	[<i>TabFreeText</i>]	[<i>TabFreeText</i>]
Detailed Comments	[<i>TabFreeText</i>]		

Figure 14: Structured Template Proforma

6.13.1 Mapping

The Structured Template proforma is mapped to a TTCN-3 structured template definition statement. Structured template definitions are all template definitions that have a *FieldSpecList* as the template body. The corresponding types are defined in a Structured Template proforma.

The **Comments** and **Detailed Comments** fields are mapped to display attributes within the *WithStatement* associated with the structured template definition. The **Comments** fields of the fields table are mapped to display attributes qualified by the field reference within the *WithStatement* associated with the structured template definition. The **Encoding** field is mapped to an encoding attribute within the *WithStatement* associated with the structured template definition. The **Element Encoding** fields are mapped to encoding attributes qualified by the field reference within the *WithStatement* associated with the structured template definition.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      template BaseTemplate [DerivedDef] := TemplateBody with {
3:          [EncodeAttribute;]
4:          [CommentsAttribute;]
5:          [FieldEncodeAttribute;]
6:          [FieldCommentsAttribute;]
7:          [DetailedCommentsAttribute;]
8:      }
9: }

```

EXAMPLE:

Structured Template			
Name	MyStructuredTemplatel1(integer para1, boolean para2)		
Group			
Type/Signature	MyStructuredType		
Derived From	MyStructuredTemplatel		
Encoding	BER		
Comments	example structured template		
Element Name	Element Value	Element Encoding	Comments
field1	13		first field
field2	para2	PER	second field
field3	para1		third field
Detailed Comments	detailed comments		

Maps to:

```

1:  module MyModule {
2:      template MyStructuredType MyStructuredTemplatel1( integer para1,
3:                                                       boolean para2)
4:          modifies MyStructuredTemplatel1 := {
5:              field1 := 13,
6:              field2 := para2,
7:              field3 := para1
8:          } with {
9:              encode "BER";
10:             display "comments := example structured template";
11:             display (field1) "comments := first field";
12:             encode (field2) "PER";
13:             display (field2) "comments := second field";
14:             display (field3) "comments := third field";
15:         }
16:     }

```

6.14 Function

Function				
Name	<i>FunctionIdentifier</i> (<i>FunctionFormalParList</i>)			
Group	<i>GroupReference</i>			
Runs On	<i>ComponentType</i>			
Return Type	<i>Type</i>			
Comments	<i>TabFreeText</i>			
	Name	Type	Initial Value	Comments
	<i>[VarConstOrTimerIdentifier]</i>	<i>[TypeOrTimer]</i>	<i>[Expression]</i>	<i>[TabFreeText]</i>
Behaviour				
	<i>FunctionStatement</i>			
Detailed Comments	<i>TabFreeText</i>			

Figure 15: Function Proforma

6.14.1 Mapping

The Function proforma is mapped to a TTCN-3 function definition statement. It is translated into three parts.

The first part consists of the header fields. The **Comments** and **Detailed Comments** fields are mapped to display attributes within a *WithStatement* associated with the function definition.

The second part are the local constants, variables and timers defined in the function definition. These definitions can occur anywhere in the function body of the core language, but for the proforma they are separated from the rest of the behaviour and displayed in a separate table. The order of their definition shall be preserved, since the definitions can depend on each other. The **Type** column shall be set to the keyword **timer** for all timers and to the constant type preceded by the keyword **const** for all constants. The **Comments** fields are converted to display attributes qualified by the local identifier within the *WithStatement* associated with the function definition.

The third part is the function body of the TTCN-3 core language minus the local constants, variables and timers. The **Comments** field is converted to a display attribute within the *WithStatement* associated with the function definition.

For an external function the behaviour only contains the keyword **external**.


```

1:  module TTCN3ModuleId[ModuleParList] {
2:      function FunctionIdentifier([FunctionFormalParList])
3:          [runs on ComponentType]
4:          [return Type] {
5:          var Type VarIdentifier [:= Expression];
6:          timer TimerIdentifier [:= Expression];
7:          const Type ConstIdentifier := ConstantExpression;
8:          {FunctionStatement}
9:      } with {
10:         [CommentsAttribute;]
11:         [VarConstOrTimerCommentsAttribute;]
12:         [DetailedCommentsAttribute;]
13:     }
14: }

```

EXAMPLE:

Function			
Name	MyFunction(integer paral)		
Group			
Runs On	MyComponentType		
Return Type	boolean		
Comments	example function definition		
Name	Type	Initial Value	Comments
MyLocalVar	boolean	false	local variable
MyLocalConst	const float	60	local constant
MyLocalTimer	timer	15 * MyLocalConst	local timer
Behaviour			
<pre> if (paral == 21) { MyLocalVar := true; } if (MyLocalVar) { MyLocalTimer.start; MyLocalTimer.timeout; } return (MyLocalVar); </pre>			
Detailed Comments	detailed comments		

Maps to:

```

1:  module MyModule {
2:      function MyFunction(in integer paral)
3:          runs on MyComponentType
4:          return boolean {
5:          var boolean MyLocalVar := false;
6:          const float MyLocalConst := 60;
7:          timer MyLocalTimer := 15 * MyLocalConst;
8:
9:          if (paral == 21) {
10:             MyLocalVar := true;
11:          }
12:          if (MyLocalVar) {
13:             MyLocalTimer.start;
14:             MyLocalTimer.timeout;
15:          }
16:          return (MyLocalVar);
17:      } with {
18:         display "comments := example function definition";
19:         display (MyLocalVar) "comments := local variable";
20:         display (MyLocalConst) "comments := local constant";
21:         display (MyLocalTimer) "comments := local timer";
22:         display "detailed comments := detailed comments";
23:     }
24: }
25:

```

6.15 Teststep

Teststep			
Name	TeststepIdentifier([TeststepFormalParList])		
Group	[GroupReference]		
Purpose	[TabFreeText]		
Runs On	[ComponentType]		
Comments	[TabFreeText]		
Name	Type	Initial Value	Comments
[VarConstOrTimerIdentifier]	[TypeOrTimer]	[Expression]	[TabFreeText]
Behaviour			
. AltGuardList			
Detailed Comments	[TabFreeText]		

Figure 16: Teststep Proforma

6.15.1 Mapping

The Teststep proforma is mapped to a TTCN-3 teststep definition statement. It is translated into two parts.

The first part consists of the header fields. The **Purpose**, **Comments** and **Detailed Comments** fields are mapped to display attributes within a *WithStatement* associated with the function definition.

The second part is the *AltGuardList* of the teststep of the TTCN-3 core language. The **Comments** field is converted to a display attribute within the *WithStatement* associated with the teststep definition.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      teststep TeststepIdentifier([TeststepFormalParList])
3:          [runs on ComponentType] {
4:              AltGuardList
5:          } with {
6:              [PurposeAttribute;]
7:              [CommentsAttribute;]
8:              [DetailedCommentsAttribute;]
9:          }
10: }

```

EXAMPLE:

Teststep			
Name	MyTeststep(integer paral)		
Group			
Runs On	MyComponentType		
Purpose	to do something		
Comments	example teststep definition		
Name	Type	Initial Value	Comments
Behaviour			
<pre> [] PC01.receive(MyTemplate(paral, CompVar) { verdict.set(inconc); } [] PC02.receive { repeat; } [] CompTimer.timeout { verdict.set(fail); stop; } </pre>			
Detailed Comments	detailed comments		

Maps to:

```

1:  module MyModule {
2:      teststep MyTeststep(integer para1) runs on MyComponentType {
3:          [] PCO1.receive(MyTemplate(para1, CompVar)) {
4:              verdict.set(inconc);
5:          }
6:          [] PCO2.receive {
7:              repeat;
8:          }
9:          [] CompTimer.timeout {
10:             verdict.set(fail);
11:             stop;
12:          }
13:      } with {
14:          display "purpose := to do something";
15:          display "comments := example teststep definition";
16:          display "detailed comments := detailed comments";
17:      }
18:  }

```

6.16 Testcase

Testcase			
Name	TestcaseIdentifier([TestcaseFormalParList])		
Group	[GroupReference]		
Purpose	[TabFreeText]		
System Interface	[ComponentType]		
MTC Type	ComponentType		
Comments	[TabFreeText]		
Name	Type	Initial Value	Comments
[VarConstOrTimerIdentifier]	[TypeOrTimer]	[Expression]	[TabFreeText]
.	.	.	.
Behaviour			
FunctionStatement			
.			
Detailed Comments	[TabFreeText]		

Figure 17: Testcase Proforma

6.16.1 Mapping

The Testcase proforma is mapped to a TTCN-3 testcase definition statement. It is translated into three parts.

The first part consists of the header fields. The **Purpose**, **Comments** and **Detailed Comments** fields are mapped to display attributes within a *WithStatement* associated with the test case definition.

The second part are the local constants, variables and timers defined in the testcase definition. These definitions can occur anywhere in the testcase body of the core language, but for the proforma they are separated from the rest of the behaviour and displayed in a separate table. The order of their definition shall be preserved, since the definitions can depend on each other. The **Type** column shall be set to the keyword **timer** for all timers and to the constant type preceded by the keyword **const** for all constants. The **Comments** fields are converted to display attributes qualified by the local identifier within the *WithStatement* associated with the testcase definition.

The third part is the testcase body of the TTCN-3 core language minus the local constants, variables and timers. The **Comments** field is converted to a display attribute within the *WithStatement* associated with the testcase definition.

```

1:  module TTCN3ModuleId[ModuleParList] {
2:      testcase TestcaseIdentifier[TestcaseFormalParList]
3:          [runs on ComponentType]
4:          [system ComponentType] {
5:              var Type VarIdentifier [ := Expression];
6:              timer TimerIdentifier [ := Expression];
7:              const Type ConstIdentifier := ConstantExpression;
8:              {FunctionStatement}
9:          } with {
10:             [CommentsAttribute;]
11:             [PurposeAttribute;]
12:             [VarConstOrTimerCommentsAttribute;]
13:             [DetailedCommentsAttribute;]
14:         }
15:     }

```

EXAMPLE:

Testcase				
Name	MyTestcase(integer para1)			
Group				
Purpose	do something useful			
System Interface	MyComponentType			
MTC Type	MyComponentType			
Comments	example testcase definition			
	Name	Type	Initial Value	Comments
	MyLocalVar	boolean	false	local variable
	MyLocalConst	const float	60	local constant
	MyLocalTimer	timer	15 * MyLocalConst	local timer
Behaviour				
<pre> default.activate { [expand] OtherwiseFail(); }; /* Default activation */ ISAP1.send(ICONreq {}); /* Inline template definition */ alt { [] MSAP2.receive(Medium_Connection_Request()) { /* use of a template */ MSAP2.send(MDATreq Medium_Connection_Confirmation()); alt { [] ISAP1.receive(ICONconf {}); { ISAP1.send(Data_Request(TestSuitePar)); alt { [] MSAP2.receive(Medium_Data_Transfer()) { MSAP2.send(MDATreq cmi_synch1()); ISAP1.send(IDISreq {}); } [] ISAP1.receive(IDISind {}); { verdict.set(inconclusive); stop(); } } } } } [] MSAP2.receive(MDATind_Connection_Request()) { verdict.set(inconclusive); stop(); } [] ISAP1.receive(IDISind {}); { verdict.set(inconclusive); stop(); } } [] ISAP1.receive(IDISind {}); { verdict.set(inconclusive); stop(); } </pre>				
Detailed Comments	detailed comments			

Maps to:

```

1:  module MyModule {
2:      testcase MyTestcase(in integer paral)
3:          runs on MyComponentType
4:          system MyComponentType {
5:              var boolean MyLocalVar := false;
6:              const float MyLocalConst := 60;
7:              timer MyLocalTimer := 15 * MyLocalConst;
8:
9:              var default MyDefault := activate(OtherwiseFail());
10:             ISAP1.send(ICONreq:{}); /* Inline template definition */
11:             alt {
12:                 /* use of a template */
13:                 [] MSAP2.receive(Medium_Connection_Request()) {
14:                     alt {
15:                         [] ISAP1.receive(ICONconf:{}) {
16:                             ISAP1.send(Data_Request(TestSuitePar));
17:                             alt {
18:                                 [] MSAP2.receive(Medium_Data_Transfer()) {
19:                                     MSAP2.send(MDATreq:cmi_synchl());
20:                                     ISAP1.send(IDISreq:{});
21:                                 }
22:                                 [] ISAP1.receive(IDISind:{}) {
23:                                     verdict.set(inconc);
24:                                     stop;
25:                                 }
26:                             }
27:                         }
28:                         [] MSAP2.receive(MDATind_Connection_Request()) {
29:                             verdict.set(inconc);
30:                             stop;
31:                         }
32:                         [] ISAP1.receive(IDISind:{}) {
33:                             verdict.set(inconc);
34:                             stop;
35:                         }
36:                     }
37:                 }
38:                 [] ISAP1.receive(IDISind:{}) {
39:                     verdict.set(inconc);
40:                     stop;
41:                 }
42:             }
43:         } with {
44:             display "purpose := do something useful";
45:             display "comments := example testcase definition";
46:             display (MyLocalVar) "comments := local variable";
47:             display (MyLocalConst) "comments := local constant";
48:             display (MyLocalTimer) "comments := local timer";
49:             display "detailed comments := detailed comments";
50:         }
51:     }

```

7 BNF productions

1. TabFreeText ::= [ExtendedAlphaNum]
2. GroupReference ::= {GroupIdentifier "/"}
3. EncRuleIdentifier ::= Identifier
4. CommentsAttribute ::= **display** "" "comments" "==" TabFreeText ""
5. DetailedCommentsAttribute ::= **display** "" "detailed comments" "=="
TabFreeText ""
6. ModuleControlAttributes ::= TabularPresentationFormatAttribute ";"
ModuleVersionAttribute ";"
ModuleDateAttribute ";"
ModuleBaseStandardRefAttribute ";"
ModuleTestStandardRefAttribute ";"
ModulePICSRefAttribute ";"
ModulePIXITRefAttribute ";"
ModuleTestMethodAttribute ";"
ModuleCommentsAttribute ";"
ModuleDetailedCommentsAttribute ";"
7. TabularPresentationFormatAttribute ::=
display "" "presentation format ETSI Tabular v1.0" ""
8. ModuleVersionAttribute ::=
display "" "module version" "==" TabFreeText ""
9. ModuleDateAttribute ::=
display "" "module date" "==" TabFreeText ""
10. ModuleBaseStandardRefAttribute ::=
display "" "module base standards ref" "==" TabFreeText ""
11. ModuleTestStandardRefAttribute ::=
display "" "module test standards ref" "==" TabFreeText ""
12. ModulePICSRefAttribute ::=
display "" "module pics ref" "==" TabFreeText ""
13. ModulePIXITRefAttribute ::=
display "" "module pixit ref" "==" TabFreeText ""
14. ModuleTestMethodAttribute ::=
display "" "module test method" "==" TabFreeText ""
15. ModuleCommentsAttribute ::=
display "" "module comments" "==" TabFreeText ""
16. ModuleDetailedCommentsAttribute ::=
display "" "module detailed comments" "==" TabFreeText ""
17. ModuleControlCommentsAttribute ::=
display "(" (VarIdentifier | ConstIdentifier | TimerIdentifier) ")"
"" "control comments" "==" TabFreeText ""
18. ModuleParPicsPixitRefAttribute ::=
display "(" ModuleParIdentifier ")"
"" "parameters pics/pixit ref" "==" TabFreeText ""

19. ModuleParComments ::=
display "(" ModuleParIdentifier ")"
 "" "parameters comments" ::= TabFreeText ""
20. ModuleParDetailedComments ::=
display "" "parameters detailed comments" ::= TabFreeText ""
21. ImportsSourceRefAttribute ::=
display "" "imports source ref" ::= TabFreeText ""
22. ImportsSourceCommentsAttribute ::=
display "" "imports source comments" ::= TabFreeText ""
23. ImportsSourceDefinitionCommentsAttribute ::=
display "(" ImportType ImportIdentifier ")" "" "imports definition
 comments" ::= TabFreeText ""
24. ImportType ::= (TypeKeyword | TemplateKeyword | ConstKeyword |
 TeststepKeyword | TestcaseKeyword | FunctionKeyword | SignatureKeyword |
 GroupKeyword)
25. ImportIdentifier ::= (Identifier | FullGroupIdentifier) | AllKeyword)
 /* STATIC SEMANTIC: FullGroupIdentifier shall only be used for group
 imports. */
26. ImportsSourceDetailedCommentsAttribute ::=
display "" "imports source detailed comments" ::= TabFreeText ""
27. EncodeAttribute ::= **encode** "" TabFreeText ""
28. SimpleTypesDetailedCommentsAttribute ::=
display "" "simple types detailed comments" ::= TabFreeText ""
29. FieldCommentsAttribute ::=
display "(" FieldIdentifier ")" "" "comments" ::= TabFreeText ""
30. FieldEncodeAttribute ::=
encode "(" FieldIdentifier ")" "" TabFreeText ""
31. SequenceOfTypesDetailedCommentsAttribute ::=
display "" "sequenceof types detailed comments" ::= TabFreeText ""
32. NamedValueCommentsAttribute ::=
display "(" NamedValueIdentifier ")"
 "" "comments" ::= TabFreeText ""
33. TypeOrSignatureCommentsAttribute ::=
display "(" TypeOrSignatureIdentifier ")"
 "" "comments" ::= TabFreeText ""
34. PortCommentsAttribute ::=
display "" "detailed comments" ::= TabFreeText ""
35. ExceptionCommentsAttribute ::=
display "(" "[" ExceptionNumber "]" ")"
 "" "comments" ::= TabFreeText ""
36. VarConstOrTimerCommentsAttribute ::=
display "(" VarConstOrTimerIdentifier ")"
 "" "comments" ::= TabFreeText ""
37. PurposeAttribute ::= **display** "" "purpose" ::= TabFreeText ""

History

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V1.1.1	March 2001	Publication
V1.1.2	June 2001	Publication
V2.2.0	May 2002	Membership Approval Procedure MV 20020705: 2002-05-07 to 2002-07-05