

Table of contents

European Foreword	6
Introduction	7
1 Scope	8
2 Normative references	10
3 Terms, definitions and abbreviated terms	11
3.1 Terms from other standards	11
3.2 Terms specific to the present standard	11
3.3 Abbreviated terms	15
3.4 Nomenclature	15
4 Principles	16
4.1 Objectives	16
4.2 Common Concepts and common types	16
4.3 Architecture	17
4.4 Time handling principle	18
4.5 Simulation lifecycle	19
4.6 Simulation method	20
4.6.1 Discrete-event simulation (DES)	20
4.6.2 Parallelization and distribution	21
4.6.3 Inter component communication	21
4.7 Models, Services and Components	22
4.7.1 Objects	22
4.7.2 Components	23
4.7.3 Models and Services	24
4.8 Publication and Persistence	25
4.9 Dynamic invocation	26
4.10 Components meta data	28
4.10.1 Catalogue	28
4.10.2 Package	29
4.10.3 Configuration	29

4.11	Model exchanges considerations	29
4.11.1	SMP Bundle	29
5	Interface Requirements	30
5.1	Common	30
5.1.1	Primitive Types specification	30
5.1.2	Time Kinds	32
5.1.3	Path string	33
5.1.4	Universally Unique Identifiers (UUID)	34
5.1.5	Exception specification	34
5.2	Components and Objects interfaces	34
5.2.1	Object Specification (IObject)	34
5.2.2	Component Specification	35
5.2.3	Aggregation	38
5.2.4	Composition	41
5.2.5	Events	43
5.2.6	Entry points	45
5.2.7	Dynamic Invocation	46
5.2.8	Persistence (IPersist)	50
5.2.9	Failures	50
5.2.10	Field interfaces	51
5.2.11	Simulation Environments interface utilization	57
5.3	Simulation Environment interfaces	58
5.3.1	Service specification (IService)	58
5.3.2	Logger (ILogger interface)	58
5.3.3	Time Keeper (ITimeKeeper)	60
5.3.4	Scheduler (IScheduler)	62
5.3.5	Event Manager (IEventManager)	70
5.3.6	Resolver (IResolver)	73
5.3.7	Link Registry (ILinkRegistry)	74
5.3.8	Simulator (ISimulator)	76
5.3.9	Persistence	87
5.3.10	Publication	88
5.3.11	Type Registry	94
5.3.12	Component Factory (IFactory)	100
5.4	Meta data	101
5.4.1	Catalogue	101
5.4.2	Package	104

5.4.3	Configuration data.....	105
6	Implementation mapping	106
6.1	Catalogue to C++	106
6.1.1	Mapping templates.....	106
6.1.2	Namespaces and files.....	109
6.1.3	Element and Type Visibility Kind	109
6.1.4	Mapping of elements.....	109
6.1.5	Basic Value Types	118
6.1.6	Compound Value Types.....	119
6.1.7	Reference Types.....	121
6.2	Package to library	124
6.2.1	Mapping templates.....	124
6.2.2	Common to Unix and Windows	125
6.2.3	Unix (Shared object)	125
6.2.4	Addendum for Windows Dynamic Link Library (DLL)	127
6.2.5	SMP Bundle	127
Annex A	(normative) Catalogue DRD	128
A.1	Catalogue DRD	128
A.1.1	Requirement identification and source document.....	128
A.1.2	Purpose and objective.....	128
A.2	Expected response	128
A.2.1	Scope and content	128
A.2.2	Special remarks	128
Annex B	(normative) Package DRD	129
B.1	Package DRD.....	129
B.1.1	Requirement identification and source document.....	129
B.1.2	Purpose and objective.....	129
B.2	Expected response	129
B.2.1	Scope and content	129
B.2.2	Special remarks	129
Annex C	(normative) Configuration DRD	130
C.1	Configuration DRD.....	130
C.1.1	Requirement identification and source document.....	130
C.1.2	Purpose and objective.....	130
C.2	Expected response	130
C.2.1	Scope and content	130

C.2.2 Special remarks	130
Annex D (normative) Manifest DRD	131
D.1 Configuration DRD.....	131
D.1.1 Requirement identification and source document.....	131
D.1.2 Purpose and objective.....	131
D.2 Expected response	131
D.2.1 Scope and content	131
D.2.2 Special remarks	133
Bibliography.....	134

Figures

Figure 4-1: Common Concepts and Type System	17
Figure 4-2: SMP Architecture	17
Figure 4-3: SMP State machine.....	19
Figure 4-4: Object mechanisms.....	23
Figure 4-5: Overview of components hierarchy	23
Figure 4-6: Component Mechanisms.....	24
Figure 4-7: Sequence of calls for dynamic invocation	27

Tables

Table 4-1: Overview of simulation states	20
Table 4-2: ViewKind values	25
Table 5-1: Primitive Types.....	30
Table 5-2: Component states	36
Table 5-3: Semantically equivalent types for connections.....	56
Table 5-4: Default Log Message Kinds.....	58
Table 5-5: Condition for emitting predefined global events	72
Table 6-1: C++ declaration templates.....	106
Table 6-2: C++ definition templates.....	108
Table 6-3: C++ mapping for the Visibility kind attribute.....	109
Table 6-4: C++ mapping without ByPointer attribute.....	111
Table 6-5: C++ mapping for the Direction kind attribute.....	112
Table 6-6: C++ mapping without ByPointer attribute.....	113
Table 6-7: C++ mapping for the Operator attribute kinds	116
Table 6-8: C++ declaration templates for packages.....	124
Table 6-9: SMP Manifest Key	131