

ISO/IEC 15909-2:2011-02 (E)

Systems and software engineering - High-level Petri nets - Part 2: Transfer format

Contents		Page
1	Scope	1
2	Conformance	1
2.1	PNML Documents	1
2.2	PNML Place/Transition Net Documents	1
2.3	Textually conformant PNML High-level Petri Net Documents	1
2.4	Structurally conformant PNML High-level Petri Net Documents	2
2.5	Place/Transition Net Document in High-level Notation	2
2.6	Symmetric Net Documents	2
3	Normative references	2
4	Terms, definitions and abbreviations	3
4.1	Terms and definitions	3
4.2	Abbreviations	5
5	Concepts	6
5.1	General Principles	6
5.2	PNML Core Model	7
5.2.1	Petri Net Documents, Petri Nets, and Objects	8
5.2.2	Pages and Reference Nodes	8
5.2.3	Labels	8
5.2.4	Graphical Information	9
5.2.5	Tool Specific Information	11
5.2.6	Data Types	11
5.3	Petri Net Type Meta Models and their Built-in Sorts	12
5.3.1	Place/Transition Nets	12
5.3.2	High-Level Core Structure	13
5.3.3	Dots	16
5.3.4	Multisets	16
5.3.5	Booleans	18
5.3.6	Finite Enumerations	19
5.3.7	Cyclic Enumerations	19
5.3.8	Finite Integer Ranges	20
5.3.9	Partitions	20
5.3.10	Symmetric Nets	21
5.3.11	High-Level Petri Net Graphs	21
5.3.12	Place/Transition Nets as High-level Net Graphs	24
6	Mapping between Part 1 and Part 2	27
6.1	Graphics and Structuring	27
6.2	Annotations of HLPNGs	27
7	PNML Syntax	29
7.1	PNML Documents	29
7.1.1	PNML Elements	29
7.1.2	Labels	29
7.1.3	Graphics	30
7.1.4	Mapping of XMLSchemaDataTypes concepts	31
7.1.5	Example	31
7.2	Mapping Petri Net Type Definitions to XML Syntax	33
7.3	Mapping for High-Level Nets	33

7.3.1	Mapping High-Level Nets meta model elements to PNML syntax	33
Annex A (normative) RELAX NG Grammar for the PNML Core Model		37
Annex B (normative) RELAX NG Grammars for special types		49
B.1	Place/Transition Nets	49
B.1.1	The labels	49
B.1.2	Token Graphics	50
B.1.3	The Grammar	51
B.2	High-level Petri Nets	52
B.2.1	Core structure of HLPNGs	52
B.2.2	Dots	61
B.2.3	Multisets	62
B.2.4	Booleans	64
B.2.5	Finite Enumerations	66
B.2.6	Cyclic Enumerations	68
B.2.7	Finite Integer Ranges	69
B.2.8	Partitions	71
B.2.9	Integers	73
B.2.10	Strings	77
B.2.11	Lists	80
B.2.12	Arbitrary Declarations	82
B.2.13	P/T Nets as restricted HLPNGs	84
B.2.14	Symmetric Nets	85
B.2.15	HLPNGs	86
Annex C (informative) PNML Example of a High-level Net		88
Annex D (informative) The PNML Framework: Easing the implementation of PNML		95
D.1	Introduction	95
D.2	Methodology	95
D.2.1	Overview	95
D.2.2	Generating the API from a model	96
D.3	Features of the PNML Framework	96
D.4	Application to a Petri nets CASE tool	97
D.4.1	Exporting Petri nets models to PNML	98
D.5	Importing Petri nets models from PNML	98
D.6	Time and effort required to develop and integrate a PNML plugin	99
D.7	Conclusion	99
D.7.1	Synthesis	99
D.7.2	The release	100
Bibliography		101