

# 1 Notation

The grammar for the Lando System Specification Sublanguage is written in the EBNF notation. The main elements of the notation that we utilize are:

- Terminals are represented with double or single quotes; e.g. "explanation".
- Optional bits are represented with squared brackets; e.g. ["explanation" paragraph].
- Repetition is represented with curly braces; e.g. {identifier}
- We use a slightly enhanced notation -  $\{a\}^+$  to indicate *non-zero* repetitions. This is simply equivalent to:  $a\{a\}$ .
- For defining terminals, we would like to use the EBNF special form to declare an extended regular expression - for example:  $?\wedge+/?$ . However since this is rather verbose, we will simply use  $\wedge+/?$  for convenience.
- Blocks in the language are typically delimited by keywords indicating the start of *another* block. In defining the grammar this translates to lookaheads: (i.e. peeking at incoming tokens without consuming them). We use the perl regular expression format to indicate this. E.g.  $/?(= \text{new-line "system"})/$ .

# 2 Grammar

lando-source	::=	{ spec-element }	Lando source
spec-element	::=	system   subsystem   component   event   scenario   requirement	Specification Elements
system	::=	"system" name-phrase-rel [ rel-keyword name-phrase ] new-line explanation new-line [ "indexing" new-line indexing new-line ] subsystem { new-line subsystem } /(?= nl-sys-keyword   eof) / block-end	System
subsystem	::=	"subsystem" name-phrase-rel [ rel-keyword name-phrase ] new-line explanation new-line [ "indexing" new-line indexing new-line ] component { new-line component } /(?= nl-subsys-keyword   eof) / block-end	Cluster
component	::=	"component" name-phrase-rel [ rel-keyword name-phrase ] new-line component-part { new-line component-part } /(?= nl-keyword   eof) / block-end	Class
component-part	::=	constraint   constraint   query	Component Parts
constraint	::=	/[^\?!\+?\.\]/m	Constraint
query	::=	/[^\?!\+?\.\?]/m	Query
constraint	::=	/[^\?!\+?\.\!]/m	Command

event	::=	"events" name-phrase new-line event-entry { new-line event-entry } <sup>*</sup> /(?= nl-keyword   eof)/ block-end	<i>Events</i>
event-entry	::=	identifier new-line sentence	<i>Event Entry</i>
scenario	::=	"scenarios" name-phrase new-line event-entry { new-line event-entry } <sup>*</sup> /(?= nl-keyword   eof)/ block-end	<i>Scenario</i>
scenario-entry	::=	identifier new-line sentence	<i>Scenario Entry</i>
requirement	::=	"requirements" name-phrase new-line req-entry { new-line req-entry } <sup>*</sup> /(?= nl-keyword   eof)/ block-end	<i>Requirements</i>
req-entry	::=	identifier new-line sentence	<i>Requirements Entry</i>
indexing	::=	index-entry { new-line index-entry } <sup>*</sup>	<i>Index List</i>
index-entry	::=	index-key ' : ' index-val-list	<i>Index List</i>
index-key	::=	/[^\:]+/	<i>Index Key</i>
index-val-list	::=	index-val { new-line index-val } <sup>*</sup> /(?= eof   nl-keyword   new-line index-key )/	<i>Index Value List</i>
index-val	::=	/[^\:]+/	<i>Index Value</i>
name	::=	identifier	<i>Name</i>
name-phrase-rel	::=	/\w[\w\s]* ( ?= rel-keyword   new-line )/	<i>Name-Phrase</i>
name-list	::=	name { ' , ' name }	<i>Name List</i>
string	::=	/[^\.]+?/	<i>String</i>
string-list	::=	string { , string }	<i>List of Strings</i>
sentence	::=	/[^\.?!] + ? [?!]/m	<i>Sentence</i>
sentence-list	::=	sentence { ' , ' sentence }	<i>String List</i>
paragraph	::=	sentence <sup>+</sup> / ( ?= ( new-line keyword   eof ) ) /	<i>Paragraph</i>
explanation	::=	paragraph	<i>Explanation</i>
keyword	::=	< allkeywords >	<i>All Keywords</i>
nl-keyword	::=	new-line keyword	<i>Keyword on new line</i>
nl-sys-keyword	::=	new-line "system"	
nl-subsys-keyword	::=	new-line ("subsystem"   "system")	
rel-keyword	::=	"inherit"   "client"   "contains"	<i>Relation keywords</i>
block-end	::=	new-line   eof	<i>Block End</i>
identifier	::=	/\w+ /	<i>Identifier</i>
new-line	::=		<i>New Line</i>