



LOLA: Quick Reference

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Abstract

LOLA (LOtos Laboratory) is a transformational and state exploration tool. **LOLA** supports the LOTOS based phases of the design cycle, transformation, execution and testing LOTOS specifications. This document is a quick reference guide for users. A more detailed explanation of the **LOLA** functionalities can be found in **LOLA: User Manual**.

1 Quick Reference

LOLA is a transformational and state exploration tool with application in simulation, testing and transformation. Accepts Full LOTOS. **LOLA** runs on Sun-3, Sun-4 (sparc) with SunOS 4.0.3 or Solaris 2.3. IBM-PC or compatible (386 or 486 required) with DOS. HP-9000 with HP-UX. Micro-VAX (DEC) with Ultrix.

To run LOLA, input : `topo <spec> -lola [-l <libr>]`. Where `<spec>.lot` is the specification file and `<libr>.lot` is an optional LOTOS types library file. From that moment on, specification and library are attached, and the library parameter can be omitted.

1.1 Testing

The following commands compute the response of a system specification to a test: *must*, *may* or *reject* according to the *Testing Equivalence* for exhaustive exploration, and *accepted* or *rejected execution* for random trace simulation.

TestExpand: Test a specification.

<p>TestExpand [<depth>] <success_event> [<test_proc>] [-v [<states>]] [-a] [-d] [-e] [-s] [-y] [-i] [-x <expected_response> [-q]] [-b <msize>] [-p <percent> [<seed>]]</p>	
<p><depth> <success_event> <test_proc> -v -a -d -e -s -y -i -x -q</p>	<p>maximum exploration depth. the name of the successful termination event. name of test process. verbose mode. Report every <states> replace behaviour with traces leading to <success_event>. replace behaviour with traces cut by <depth>. replace behaviour with traces leading to <i>exit</i>. replace behaviour with traces leading to <i>stop</i>. force exploration of all the possible executions. do not remove internal actions. exit test as soon as response does not match <expected_reponse>. exit LOLA with 1 if the -x condition holds.</p>
<p>-b -p</p>	<p>heuristic partial exploration using utmost <msize>(MB) extra memory. random partial exploration of <percent>% of alternatives in states.</p>

OneExpand: Execute random traces of the current behaviour or the composition behaviour - test.

OneExpand <depth> [<success_event> <test_process>] [<seed> [<execs>]] [-v] [-i]	
<depth>	maximum exploration depth.
<success_event>	the name of the successful termination event.
<test_proc>	name of test process.
<seed>	initial value for a random number generator.
<execs>	number of traces to be executed.
-v	verbose mode.
-i	do not remove internal actions.

1.2 Simulation/Debugging

These operations are used either to simulate LOTOS specifications step by step, or to evaluate data value expressions.

Step: simulate a behaviour step by step.

Step [<success_event> <test_process>]	
Commands in Step mode:	
Print	print the behaviour of the current state.
Menu	menu of transitions offered at the current state.
Refused	menu of unsuccessful synchronizations at the current state.
Sync <n> [<proc>]	- for a transition <n> : show the events that produced it. - for an unsuccessful synchronization <n> : show the events that could not synchronize. Each event is displayed below the stack of processes instantiated to produce it. If the name <proc> is specified then only the instantiations of that process are displayed.
<n>	execute the transition labelled <n> from the menu of transitions.
Undo	undo the last simulation step.
Trace	sequence of transitions that lead to the current state.
Exit	quit simulation mode.
?	help.

Rewrite: evaluate data value expressions.

Rewrite <expression>	
<expression>	data value expression to evaluate.

1.3 Expansion

The expansion transformations calculate symbolically all the possible executions of a LOTOS behaviour, i.e. they obtain its labelled transition system expressed in LOTOS.

Expand: calculate the EFSM (Extended Finite State Machine) of a behaviour.

Expand [<depth>] [-v] [-i]	
<depth>	maximum expansion depth. Default infinite (-1).
-v	verbose mode.
-i	remove internal actions.

VarExpand: calculate the parameterized EFSM of a behaviour.

VarExpand [<depth>] [-v] [-i]	
<depth>	maximum expansion depth. Default infinite (-1).
-v	verbose mode.
-i	remove internal actions.

FreeExpand: calculate the behaviour tree (without detecting duplicated states).

FreeExpand [<depth>] [-v] [-i]	
<depth>	maximum expansion depth. Default infinite (-1).
-v	verbose mode.
-i	remove internal actions.

InterExpand: compute the interleaved expansion of a behaviour.

InterExpand [<depth>] [-d -p] [-v]	
<depth>	maximum depth of synchronizations in the exploration.
-d	look for duplicate states.
-p	look for parameterized duplicate states. (-p implies -d).
-v	verbose mode.

1.4 Miscellaneous operations

LOLA also has a set of miscellaneous operations to load and print the specification, to navigate throughout the behaviours, etc.

Help: help on commands.

Help [<command_name>]	
<command_name>.	the name of a LOLA command.

Quit: quit **LOLA**.

Quit

Load: reload the original specification.

Load

Print: print the current specification.

Print [-p] [-t] [-a] [-c] [<depth>] [<output_file>]	
-p	print process definitions.
-t	print data type definition.
-a	print the whole specification.
-c	output format: LOTOS or LITE CR.
<depth>	printing depth.
<output_file>	output file.

Move: move LOLA's internal cursor.

Move [<position>] [<position>] ...	
<position>	moves cursor to
<number>	line <number> of the current behaviour. Line numbers are displayed invoking <i>move</i> without parameters. After any movement or transformation these lines are forgotten until the next <i>move</i> command.
^	specification root.
<process_name>	process definition, called <process_name>.
<number>d	down <number> LOTOS operators.
<number>u	up <number> LOTOS operators.
<number>b	<number>-th operand (branch) of the current operator.

DataTable: show the internal identifiers tables.

DataTable -s v o p g [<low_limit>] [<high_limit>]		
	-s	table of sorts.
	-v	table of variables.
	-o	table of operations.
	-p	table of processes.
	-g	table of gates.
	<low_limit>	first position of the table.
	<high_limit>	last position of the table.

Statistics: display memory and CPU time usage (not available in all systems).

Statistic

Set: Assign a default value for command options and pre-expansion processing.

Set [<variable> [<value>]]

Type **Set** for a list of variables and their current values. **Set <variable>** to reset a variable to its initial default value.

Command: Execute a LOLA command file (redirect input temporarily).

Command <command_file>
