

NAME

nupn_info – query and transformation of Nested-Unit Petri Nets

SYNOPSIS

nupn_info *option* [*filename.nupn*]

DESCRIPTION

Taking as input *filename.nupn* (or by default the standard input), which contains a Nested-Unit Petri Net (NUPN) encoded in the **nupn(LOCAL)** format, **nupn_info** performs various analyses or transformations, depending on the *option* specified on the command-line, and writes the corresponding results to the standard output.

OPTIONS**-canonical-nupn**

Simplify (if possible) the input NUPN to put it under a normal form. The following transformations are applied: tabulations are replaced with spaces; empty or blank lines are deleted; extra spaces are removed; the description of units and the description of transitions are sorted by increasing numbers; the list of sub-units of each unit is sorted by increasing numbers; the lists of input and output places of each transition are sorted by increasing numbers; any line of the following form **"initial place %dP"** is replaced with **"initial places #1 %dP"**; any line of the following form **"labels 0 0 0 %dP"** is deleted; the maximal length of labels (4th argument of the "labels" line) is recomputed and set to its minimal value. The resulting NUPN is displayed on the standard output.

-place-fusion

Apply the place-fusion abstraction to the input NUPN, merging in each unit all the places of this unit into a single place. The resulting NUPN has as many places as it has non-void units. Places may be renumbered if merged places are deleted; unit and transition numbers are kept unchanged. The resulting NUPN is displayed on the standard output.

-redundant-removal

Eliminate all redundant units from the input NUPN, i.e., units containing exactly one (directly nested) sub-unit. Units and places may be renumbered if redundant units are deleted; transition numbers are kept unchanged. If the input NUPN has no redundant unit, the only changes applied are those performed by option **-canonical-nupn**. The resulting NUPN is displayed on the standard output.

-trivial-units

Erase the existing unit structure of the input NUPN and replace it with the trivial unit structure, in which each unit contains a single place, except the root unit, which has no place and contains all the other units. The resulting NUPN has as many non-void units as it has places. Units may be renumbered if new units are added; place and transition numbers are kept unchanged. The resulting NUPN is displayed on the standard output.

-void-removal

Eliminate all void (non-root) units from the input NUPN, i.e., units containing no local places. Units may be renumbered if void units are deleted; place and transition numbers are kept unchanged. If the input NUPN has no void (non-root) unit, the only changes applied are those performed by option **-canonical-nupn**. The resulting NUPN is displayed on the standard output.

For performance reasons, **nupn_info** assumes that the contents of the input NUPN are correct. When dealing with an unknown NUPN, it is therefore advisable to first analyze its contents with the **-check** option of **caesar.bdd(LOCAL)**. However, certain options (especially **-canonical-nupn** and **-void-removal**) may transform an incorrect NUPN into a correct one.

NUPN (NESTED-UNIT PETRI NET) FORMAT

See the **nupn(LOCAL)** manual page for a detailed definition of the NUPN file format.

EXIT STATUS

The exit status of **nupn_info** is zero if execution went well; in such case, a valid NUPN file is written to the standard output. Otherwise, a non-zero exit status is returned and an error message may be displayed to the standard output.

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FILES

filename.nupn Nested-Unit Petri Net (input)

BIBLIOGRAPHY

[Gar19] Hubert Garavel. "Nested-Unit Petri Nets". Journal of Logical and Algebraic Methods in Programming, vol. 104, pages 60-85, April 2019. Available from <http://cadp.inria.fr/publications/Garavel-19.html>

[Gar15] Hubert Garavel. "Nested-Unit Petri Nets: A Structural Means to Increase Efficiency and Scalability of Verification on Elementary Nets". In R. Devillers and A. Valmari, editors, Proceedings of the 36th International Conference on Application and Theory of Petri Nets and Concurrency (PETRI NETS'15), Brussels, Belgium. Lecture Notes in Computer Science, vol. 9115, Springer, 2015. Superseded by [Gar19]. Available from <http://cadp.inria.fr/publications/Garavel-15-a.html>

SEE ALSO

caesar.bdd(LOCAL), **nupn(LOCAL)**

Additional information is available from the CADP Web page located at <http://cadp.inria.fr>

Directives for installation are given in files **\$CADP/INSTALLATION_***.

Recent changes and improvements to this software are reported and commented in file **\$CADP/HISTORY**.

BUGS

Please report new bugs to Hubert.Garavel@inria.fr