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Service net algebra based on logic Petri nets. (English) Zbl 1341.68130

Summary: Web service process reuse can help us efficiently to construct a new service or service process by using the existing service processes generated by service composition. Since service requests are characteristic of multiformity, the existing service processes can hardly be reused unless they are modified and transformed to some specific scenarios. In this paper, a service process is modeled as a service net (SN) using logic Petri nets. Inspired by the relational algebra, service net algebra (SNA) is proposed to provide a formal foundation for structural transformations of SNs including composition and decomposition. It is constructed on the basis of logic Petri nets and consists of structure algebra, evolution algebra and synthesis algebra. Some algebra operators of SNA are defined, and their corresponding operational rules are presented. The properties and soundness preservation of SNA are analyzed. A framework for service process reuse is also given based on SNA.

MSC: 68Q85 Models and methods for concurrent and distributed computing (process algebras, bisimulation, transition nets, etc.)

Keywords: service net algebra; service process; reuse; Petri net

Full Text: DOI

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