

198. ROBUST SERVICE COMPOSITIONS WITH FUNCTIONAL AND LOCATION DIVERSITY

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Service composition provides a means of customized and flexible integration of service functionalities. Quality-of-Service (QoS) optimization algorithms select services to adapt workflows to the non-functional requirements of the user. With increasing number of services in a workflow, previous approaches fail to achieve a sufficient reliability. The major problem with such sequential application of planning and replanning is that it ignores the potential costs during the initial planning and they consequently are hidden from the decision maker. Our idea to overcome this problem is to compute a QoS optimized selection of service clusters that includes a sufficient number of backup services for each service employed. These backup services should be sufficiently distributed to prevent a task failure in case of, e.g., a network failure. To support the decision maker in the selection task, our multi-objective approach considers the possible repair costs directly in the initial composition. Our graphical user interface visualizes the resulting QoS of the workflow and the location of the services to enable the decision maker to select compositions in line with risk preferences. We prove the benefits of our approach in our detailed evaluation.

Index Terms- Service Oriented Computing, QoS-aware Service Composition, Multi-Objective Optimization.