Abstract
The advent of the Smart City domain has led to the creation of massive amounts of diverse data. Stakeholders in this domain need to be able to analyze this data in order to make informed planning decisions. To address this complex task, Distributed Analytical Environments (DAEs) have emerged. These environments consist of different distributed analytical and data services, which are composed in a dynamic way to deliver insights that are crucial for stakeholders. Since these environments deal with business critical and sensitive information, strict compliance constraints apply. These constraints lead to situations where certain concrete services are not allowed to exchange data, even though their interaction is necessary to produce the desired results. Finding a valid solution in the space of possible instantiations is a non-trivial problem. In this paper we introduce Nomads, a framework that enables service mobility in such constrained dynamic composition environments to overcome aforementioned restrictions. The framework improves the overall satisfiability and therefore also the quality of constrained DAEs. We outline the requirements of a representative DAE scenario, provide a detailed problem formulation, and then discuss the service mobility framework along with our solution finding algorithm. The evaluation demonstrates that the Nomads framework considerably increases the number of successfully performed compositions even in highly constrained environments.