Abstract
The cloud computing paradigm enables the development of applications that can elastically react to changes in their environment by autonomously provisioning and releasing infrastructure resources. However, current applications need to be specifically tailored to a concrete cloud provider infrastructure, leading to vendor lock-in. Migrating applications to the cloud or between cloud providers is challenging due to differences in deployment directives, available services, and programming interfaces. Existing infrastructure as code approaches closely tie application artifacts to their deployment directives and do not allow for a clear separation of application artifacts from deployment infrastructure. In this paper, we present Smart Fabric, a methodology and accompanying toolset for infrastructure-agnostic deployment of application artifact topologies based on a constraint-based, declarative specification of the required deployment infrastructure. Our framework allows for seamless migration of application topologies between deployment targets and enables independent, parallel evolution of both, applications and underlying infrastructure. We discuss the feasibility of the proposed methodology and prototype implementation using representative applications from the Internet of Things and smart city domains.