

## Fiche doctorat

**Titre :** Decision Support System based on Economics to Deploy in a Multi-cloud Environment a Distributed Microservice-based Application

**Mots clefs :** Multi-cloud Selection Process, Multi-Requirements, Microservice, Distributed Application

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**Description :** Cloud Computing has become a popular IT service delivery model in recent years. While the cloud brings several benefits, there are still some challenges that need to be overcome to apply the cloud model in certain scenarios. One such problem is to deploy and to execute the applications composed of services or components hosted by different cloud providers because there are several cloud providers, and each of them offers various services with the same capabilities and different capabilities. Thus, for the software architect to deal with these issues is the complex task. Some solutions have been proposed to deal with part of the problem, and many of them focus on meeting the cloud providers. Therefore, we propose PacificClouds: a new approach for the deployment and execution management of distributed applications across multiple clouds, which focuses on the software architect perspective. PacificClouds differs from previous works because it provides greater flexibility due to the microservices architectural pattern. One of the first tasks of PacificClouds is to select cloud providers to host each microservice of an application. The choice should be made based on the software architect requirements and the microservice needs, considering that each microservice needs various services. Hence, to select multiple cloud providers is a complex task because the chosen cloud provider must have all services necessary to compose a microservice and, meet all the software architect requirements. Accordingly, we proposed three approaches to select multiple cloud providers for hosting each microservice of an application, which must be used by PacificClouds. In order to those goals of this Ph.D. project can be met, we also propose a definition, a classification, and taxonomies related to the resource management in multiple clouds from the user perspective, and a definition of microservices in a multi-cloud context. Furthermore,

we propose a comparative analysis of the works related to PacificClouds and the multiple cloud selection.