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A Novel Docker-based Approach for Development of Cloud Applications

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ABSTRACT

In this poster, we present a novel approach to automatically develop and deploy business applications in the cloud. The approach handles links and dependencies between services. We adopt a real case study to show the feasibility of the method and we use the docker as a development tool.

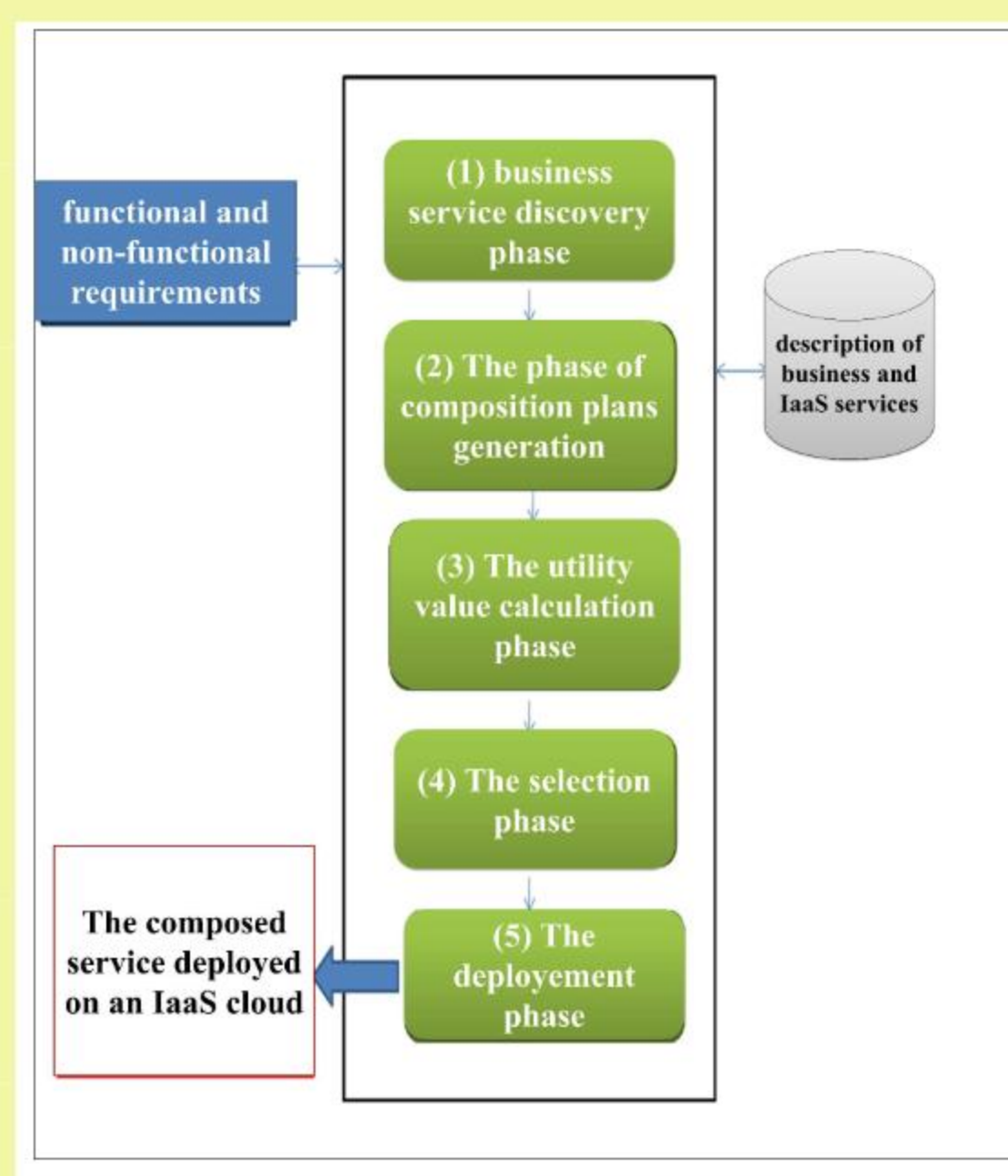
1. INTRODUCTION

The applications deployed in cloud are represented by the combination and collaboration of several components, whose role is to perform specific functions. In most research, these components are represented by business services [1,2,3]. Business services provide more global features than Web services. They represent application packages that can be deployed across multiple infrastructures. Indeed, they reduce the number of services to be invoked when developing applications with a lot of features [1,3]. Business services can invoke web services.

In our work, we will modify the approach described in [3] in order to improve the selection, and decrease the number of composition steps.

2. OVERVIEW

the proposed approach is composed from different phases shown in the following figure.



3. DESCRIPTION OF SERVICES

We defined the business services in our work, by packages, which are described by: a descriptive file, composition and deployment constraints:

1- Descriptive file:

Each business service has a descriptive file that presents its description and characteristics,

2- Composition constraints:

They represent the set of services with which it must be composed. For example, the Joomla service must be composed with a database service.

3- Deployment constraints:

They include the required resources ensuring its proper functioning (i.e. a virtual machine with a particular hardware / software configuration).

3. THE PHASES OF THE PROPOSED APPROACH

This section describes the different phases of the proposed approach:

1- Business Service Discovery Phase

This phase consists of looking for business services that meet user requirements' functionalities. This requires matching the user requirements with existing services. For the sake of simplicity, we adopt a syntactic matching.

2-The phase of composition plans generation.

We can build multiple composition plans from the business services discovered during the discovery process, taking into account compositional constraints and deployment constraints. Each composition plan represents a solution to the user's request

3- The utility value calculation phase

This phase calculates the utility value of each generated composition plan. it is based on the values of the QoS parameters of each generated composition plan

4- The selection phase

At this phase, the composition plan with the best utility value will be selected

5- The deployment phase

This phase consists of deploying the selected composition plan that was generated in the composition plans generation phase. The deployment will be done on the selected IaaS

4. SECTION FIVE

We have used the Docker [4] for deployment management, and the dependency between business services of a composition plan.

Service	Version	Created	Size
tomcat	8	5 weeks ago	558MB
tomcat	8-jre8	5 weeks ago	558MB
tomcat	latest	5 weeks ago	558MB
kartoza/postgis	latest	6 weeks ago	514MB
karloza/geoserver	latest	6 weeks ago	751MB
fenglc/ppadmint	latest	6 weeks ago	252MB
java	8	14 months ago	643MB
java	latest	14 months ago	643MB

5. CONCLUSIONS

In this work, we have proposed an improved approach for the development and automatic deployment of business applications in the cloud. Our approach takes into account the different composition and deployment constraints between business services.

As a perspective, we plan to improve the service research phase, taking into account the semantic aspect.

REFERENCES

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