PAChA
Portable Cloud Appliance

Nabil Abdennadher, Olivier Belli, Marc-Elian Bégin, Charles Loomis

Brief description

Non-IT SMEs often stay away from public clouds because they cannot quantify the financial gain of using these new technologies. The PAChA project has two goals:

1. to develop a new type of private cloud appliance (portable, inexpensive, self-managing and secure) and monitor the resources used by various applications running on it;
2. to develop tools to estimate the potential savings (based on a pricing model) when deploying applications on our private cloud, public or hybrid cloud.

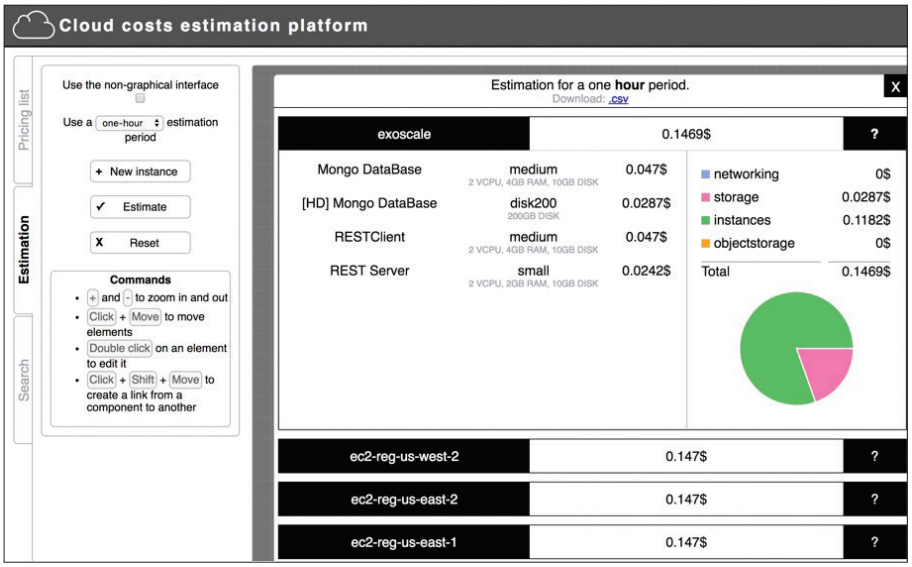
Key points

The key strengths of this project are threefold.

First, we diversify our (HES-SO, hepia) portfolio of applied research activities by exploring areas more directly connected to the Swiss economy (i.e. the start-up SixSq).

Second, we provide Swiss SMEs with an easy and inexpensive way of using cloud computing technologies, thereby addressing one of their main concerns in IT.

Third, we solve a real-life problem by cooperating with a local startup.



The Cost Optimisation Cloud Application Placement Tool: COCA-PT

Cloud computing is gradually becoming the de facto standard for doing IT. Its key benefits are the reduction of IT infrastructure costs and improved agility. Many non-IT Small and Midsized Enterprises (SMEs), however, have been left out of this evolution, primarily due to cost and privacy concerns. The goal of the PAChA project is to address this technological gap, especially for Swiss non-IT SMEs. From a business point of view, the key benefits of this project are twofold:

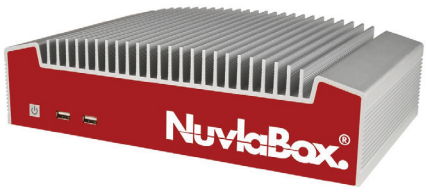
1. Provide non-IT SMEs with an easy and inexpensive way of using a private cloud.
2. Help them leverage the advantages of a hybrid cloud by assessing how much they would save by migrating some of their applications to a given public cloud (e.g., exoscale in Switzerland or Amazon Web Services in the U.S.).

From a scientific/technical point of view, the key innovation of this project is to design and develop a portable cloud appliance with the following characteristics:

1. It is self-managing (autonomic system) and can therefore work in turn-key mode, without any system administrator.
2. It is secure (embedded firewall).
3. It monitors the activities of all the applications running on it.
4. It assesses the cost of running each application on different public clouds.
5. It provides customers with a dashboard showing which applications would cost less if they were migrated to a public cloud (based on a pricing model), and what financial gain could be expected by doing so.

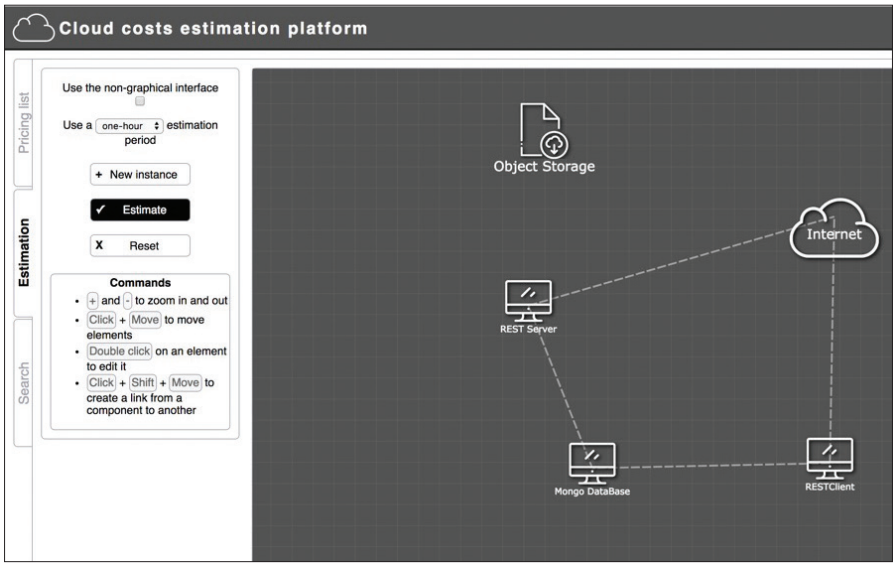
h e p i a
Haute école du paysage, d'ingénierie et d'architecture de Genève

Hes·so Genève
Haute Ecole Spécialisée de Suisse occidentale



1

2



3

Output

A decision support system (DSS) has been developed in the PAChA project. This DSS is based on a cost-optimised cloud application placement tool and a Resource Consumption Model (RCM) that were designed within the PAChA project. The ultimate goal of this DSS is to optimize the placement of an application based on price. The DSS is available on this URL: http://lsds.hesge.ch/coca.

Special equipment

Two types of validation experiments were conducted to validate the PAChA project:

1. Calculators: Some cloud providers have pricing calculators to assess the cost of launching services on their cloud (i.e. Amazon, Google, Microsoft). We can then compare this assessment with the cost provided by COCA-PT. This experiment is straight-forward, it has the advantage of estimating the costs before any deployment. However, it has three main disadvantages: (1) most providers do not offer a pricing calculator, (2) calculators only offer estimations, and (3) this approach is theoretical as it does not use real data.
2. Usage Bills: The idea is to deploy an application within a certain context on a particular cloud infrastructure. Then, compare the cost provided by COCA-PT with the amount of the cloud provider's bill. In this context, two cloud providers have been used as a target platforms: Amazon AWS and Exoscale.

Legend

1 - NuvlaBox: a private cloud appliance
2 - SlipStream: a multi-cloud application management Platform
3 - COCA-PT Interface

h e p i a
Haute école du paysage, d'ingénierie et d'architecture de Genève

Ra&D
Rue de la Prairie 4
CH - 1202 Genève

Tél. +41 (0)22 546 24 00
rad.hepia@hesge.ch
www.hesge.ch/hepia