Introduction

• Distributed applications require the execution of complex workflows consisting of computing modules with inter-module communications in large network environments.

• These workflows constitute a common pattern for describing a wide range of applications such as business processes, scientific applications, and web services.

• In this work, we study the workflow execution in Hybrid clouds. A hybrid cloud (HC) is a composition of two or more heterogeneous resource infrastructures (Figure 1. private, community, and/or public).

Challenges

Hybrid clouds encounter the following two main obstacles in reaching their full potential:

• Customers dissatisfaction due to the conflicting nature of the constraints (budget and deadline)

• Exposure of customers’ private data in hybrid cloud infrastructures.

Solution

We designed, implemented and evaluated a multi-criteria workflow scheduler in hybrid cloud environment, Multiterminal Cut for Privacy in Hybrid Clouds (MPHC), to optimise cost under privacy and deadline constraints. We solve the privacy issue by applying multiterminal cut algorithm to partition the workflow based on tasks privacy privilege.

Result

We compared MPHC with two efficient algorithms each considering one constraint only:

• IC-PCP[1] scheduler considers the workflow’s deadline but ignores its privacy requirements.

• DAGMan/HTCondor[2] scheduler assigned tasks according to their privacy requirements to machines; however, ignored the workflow deadline.

Contribution

1. Optimising the cost and improving the efficiency of cloud resources while preserving privacy for workflow scheduling under customers requirements such as deadline and budget.

2. An improved cost model for hybrid cloud environments.

3. Evaluation of a privacy preservation scheduling algorithm using the defined cost model for various de facto standard experimental workflows.

References
