Management towards Reducing Cloud Usage Costs

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Abstract—Many organizations are attracted to cloud computing as an ICT (information and communications technology) sourcing model that can improve flexibility and total cost of ICT systems. However, it can be difficult for a prospective cloud customer to determine and manage cloud usage costs. We present an overview of several NICTA research projects that aim at providing information that can help ICT professionals determine various cloud usage costs and make decisions that are appropriate from the business viewpoint. Before migrating an application into a cloud, it is necessary to choose to which cloud to migrate, because there is a huge variety of cloud offerings, with significantly different pricing models. To accurately capture projected operating costs of an application in a particular cloud and enable side-by-side comparison of cloud offerings from different providers, NICTA developed a cost estimation tool that calculates the costs based on usage patterns and other characteristics of the application. This tool can also be used during runtime as an input into making adaptation/control decisions. To collect various runtime metrics (e.g., about the amount of transferred data or received quality of service – QoS) that are necessary for operational management and assessment of cloud usage costs, NICTA developed an innovative tool for flexible and integrated monitoring of applications in clouds and (in case of hybrid clouds) related local data centers. To help determine which runtime adaptation/control decisions are best from the business viewpoint (e.g., incur lowest cost), we extended the WS-Policy4MASC language and MiniZnMASC middleware for autonomic business-driven IT management with events and adaptation actions relevant for cloud management. The tools from the presented projects can be used separately or as parts of a powerful integrated cloud management system (which contains several additional tools).

Keywords—cloud computing; cost estimation; cloud management; business-driven IT management; system management; monitoring; runtime adaptation

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