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Improving Security in Cloud by Formal Modeling of IaaS Resources

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Abstract

Nowadays, it is a matter of fact that Cloud is a "must" for all complex services requiring great amount of resources. Big-Data Services are a striking example: they actually perform many kind of analysis (like analytics) on very *big* repositories. Many File Systems and middlewares exist for efficient distribution and management of data and they usually use Cloud Resources. Anyway Several problems arose about Security of data: Virtualization is the base of Cloud resources and, even if we consider data storage as *virtually* separated elements, security issues exist if privilege escalation allows for gaining control on any data on *physical* hosts. In this paper we show how it is possible to cope Model Driven Engineering techniques to security analysis and monitoring of Cloud infrastructures. For reducing overhead, we provide a formal profile of hosts thermal behaviors. Depending on services input workloads, we detect and forecast malicious actions by comparisons with real thermal data.

Keywords: Cloud services, Verification, Big-Data, Security

1. Introduction

In the age of Big-Data, Cloud Computing is the best solution to the problem of acquiring enough computational, network and storage resources in order to

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