loreti2018DistributedApproachCompliance

Title

A Distributed Approach to Compliance Monitoring of Business Process Event Streams (Loreti et al. (2018))

Abstract

In recent years, the significant advantages brought to business processes by process mining account for its evolution as a major concern in both industrial and academic research. In particular, increasing attention has been turned to compliance monitoring as a way to identify when a sequence of events deviates from the expected behaviour. As we are entering the IoT era, an increasing variety of smart objects can be introduced in business processes (e.g., tags to track products in a plant, smartphones and badge swiping to draw the activities of customers and employees in a shopping centre, etc.). All these objects produce large volumes of log data in the form of streams, which need to be run-time analysed to extract further knowledge about the underlying business process and to identify unexpected, non-conforming events. Albeit rather straightforward on a small log file, compliance verification techniques may show poor performances when dealing with big data and streams, thus calling for scalable approaches. This work investigates the possibility of spreading the compliance monitoring task over a network of computing nodes, achieving the desired scalability. The monitor is realised through the existing SCIFF framework for compliance checking, which provides a high level logic-based language for expressing the properties to be monitored and nicely supports the partitioning of the monitoring task. The distributed computation is achieved through a MapReduce approach and the adoption of an existing general engine for large scale stream processing. Experimental results show the feasibility of the approach as well as the advantages in performance brought to the compliance monitoring task.

Keywords

Business process management, Distributed compliance monitoring, MapReduce, Stream processing

Loreti, Daniela, Federico Chesani, Anna Ciampolini, and Paola Mello. 2018. "A Distributed Approach to Compliance Monitoring of Business Process Event Streams." *Future Generation Computer Systems* 82 (May): 104–18. https://doi.org/10.1016/j.future.2017.12.043.