A business process monitor for a mobile phone recharging system

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Abstract

Dependable (i.e. accurate and timely) monitoring is a key aspect of business process management, since it provides information which is crucial for determining the actual Quality of Service (QoS) delivered to individual parties, and for promptly handling off-plan deviations. This paper describes a business process monitor for the recharging system of a mobile phone network provider. The monitored system is currently in operation for the major mobile phone company in Italy, namely Telecom Italia Mobile (TIM). Due to the amazingly high throughput of the monitored system, meeting the performance requirements for the monitor was a challenging issue. A buffer-based implementation of the monitor system failed to meet such requirements. In this paper, we propose a stream-based architecture, which exceeds the performance requirements imposed by the monitored application. The paper provides a detailed description of the monitor system architecture, including a discussion of technology choices, and an experimental evaluation of the performance boost achieved by resorting to a streaming approach. The proposed solution also exploits grammar-based pluggable parsers for rapid and seamless integration of heterogeneous data feeds.

Keywords: Business process monitoring; Quality of Service; Stream processing; Dependable middleware; Mobile phone operators