An efficient framework to investigate the root cause of SLO violation in 5G Online Charging Systems

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(Pt9)Abstract—**Rapid deployment of 5G networks presents challenges in ensuring service quality and reliability. Service Level Objective (SLO) violation incidents critically affect 5G network functions, resulting in service interruptions, revenue loss, and reduced customer satisfaction. These incidents can arise from network congestion, misconfigurations, and hardware/software errors. SLO violations can be quickly detected through metrics and alerting rules; however, an efficient solution is required to investigate the root cause and restore the system to a healthy state. In this paper, we propose a generalizable framework for root cause investigation that enables timely analysis of SLO violation incidents in 5G Online Charging Systems, including the Policy Control Function (PCF) and the Charging Function (CHF). The framework integrates with multiple data sources to provide topology-based context and collect information about related objects. It also incorporates an analytic service for time series pattern recognition and anomaly detection based on service profiles. Experimental results demonstrate that the framework helps operators identify incident root causes efficiently.**

(Pt9)Keyword—**5G, Online Charging System, SLO violation investigation, root cause analysis**

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