RED-Based Technique for Detecting and Avoiding Anomaly Network Congestion

Mohamed Mostafa Montaser[1], Abdulghani Ali Ahmed[1]

[1]Faculty of Computer Systems & Software Engineering,
University Malaysia Pahang, 26300, Pahang, Malaysia
Corresponding author Email: abdulghani@ump.edu.my

Active Queue Management (AQM) is an intelligent drop of network packets within the network routers as a result of buffer saturation to reduce network congestion. Random Early Detection (RED) mechanism is the most used mechanism among the existing AQMs, as it can avoid network congestion at the early stages. The RED mechanism prompts users to reduce their windows size when the queue average has exceeded a predefined threshold. However, some users do not respond to these notifications, and therefore, RED drops all packets in the link. This will generate a false alarm because the well-behaving packets on that link will be dropped as well. This study proposes a technique for monitoring gateways' queues and dropping only the misbehaving packets. Every RED gateway reports the packet transfer rate (PTR) of misbehaving users that have exceeded their bandwidth shares to the SLA management (SLAM) unit. The SLAM unit will compute the users' PTRs and compare them with their predefined ratios in the SLA. Users that have exceeded the SLA-predefined threshold will be considered as misbehaving and isolated from the normal users. The obtained results show that the proposed technique is efficient in identifying the misbehaving packets and avoiding network congestion.