SIP Server Overload Mechanisms

“Lead Inventors: Henning Schulzrinne, Ph.D., Charles Shen

Preventing Congestion Collapse of Session Initiation Protocol Servers Session Initiation Protocol (SIP) is a protocol for establishing media sessions in an IP network. A SIP network consists of a SIP server and SIP endpoints. The SIP server may become overloaded by emergency call-volume, “American Idol” flash crowd effects or denial of service attacks. The overload control mechanism defined in the SIP protocol cannot protect the server from entering congestion collapse under heavy load. Therefore, it is necessary for the SIP server to notify upstream servers to have them only send the amount of load within the receiving server’s processing capacity. Further, an overloaded server must ensure user-level and server-level fairness.

Window-Based Feedback Algorithms with Rate-Based Feedback Algorithms Protect SIP Server During Overload
A SIP server can notify its upstream SIP servers that it is overloaded by using a rate-based mechanism or a window-based mechanism. The technology proposes three new window-based feedback algorithms. These three new mechanisms are compared with two existing rate-based feedback algorithms in terms of the number of tuning parameters, and performance under both steady and variable load. These algorithms adapt well to variations in traffic load and achieve user-level and server-level fairness.

Applications:
• Protecting a SIP server during overload. The overload can happen due to flash crowds, emergency calls, or due to denial-of-service (DoS) attack

Advantages:
• Helps protects a SIP server during call overload
• Provides user-level fairness and server-level fairness during overload
• Easy to implement and has less tunable parameters compared to other approaches

Patent Status: Patent Pending

Licensing Status: Available for Licensing and Sponsored Research Support


Patent No. 8,737,220
Inventors

Henning Schulzrinne