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A Fog-Centric Secure Cloud Storage Scheme

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Abstract

Cloud computing is now being utilized as a prospective alternative for catering storage service. Security issues of cloud storage are a potential deterrent in its widespread adoption. Privacy breach, malicious modification, and data loss are emerging cyber threats against cloud storage. Recently, a fog server based three-layer architecture has been presented for secure storage employing multiple clouds. The underlying techniques used are Hash-Solomon code and customized hash algorithm in order to attain the goal. However, it resulted in loss of smaller portion of data to cloud servers and failed to provide better modification detection and data recoverability. This paper proposes a novel fog-centric secure cloud storage scheme to protect data against unauthorized access, modification, and destruction. To prevent illegitimate access, the proposed scheme employs a new technique Xor - Combination to conceal data. Moreover, Block-Management outsources the outcomes of Xor - Combination to prevent malicious retrieval and to ensure better recoverability in case of data loss. Simultaneously, we propose a technique based on hash algorithm in order to facilitate modification detection with higher probability. We demonstrate robustness of the proposed scheme through security analysis. Experimental results validate performance supremacy of the proposed scheme compared to contemporary solutions in terms of data processing time.

Keywords

Author Keywords: Cloud storage; fog server; Xor-Combination; CRH; privacy

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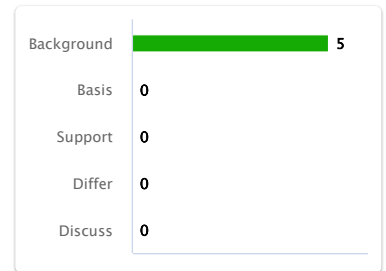
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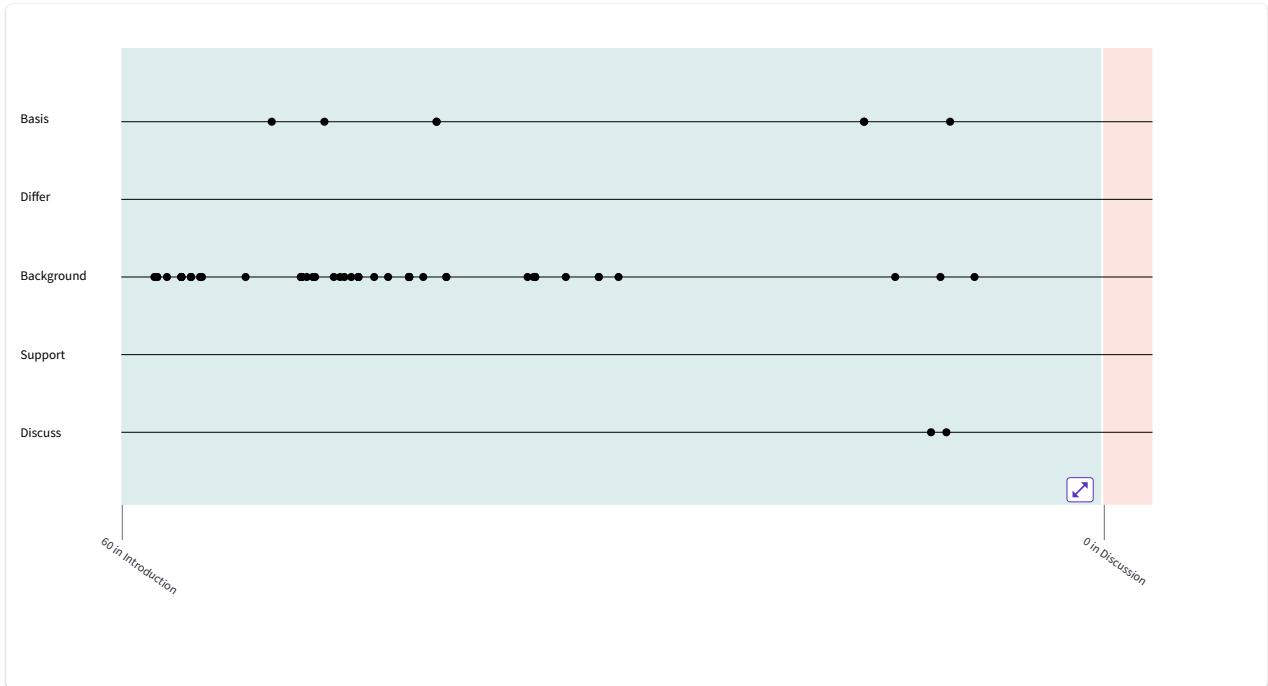
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