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Modern Methods of Backend System Performance Optimization: Algorithmic, Architectural, and Infrastructural Aspects

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Abstract: *This article explores modern methods of backend system performance optimization aimed at reducing latency and increasing the throughput of server applications. Algorithmic approaches such as asynchronous request processing, efficient thread management, and caching are examined, as well as architectural solutions including multi-tier architecture, distributed systems, and microservices. Load balancing methods and the use of message queues are also discussed. Special attention is given to horizontal scaling strategies and database performance optimization. Additionally, key aspects that influence the overall system throughput improvement are analyzed.*

Keywords: performance optimization, backend systems, latency, throughput, asynchronous request processing, thread management, caching, multi-tier architecture

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