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PRIVACY-PRESERVING API COMPOSITION IN MICROSERVICES ARCHITECTURE

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ABSTRACT

Though microservices now shape much of modern app design, their reliance on frequent API exchanges opens new gaps in data protection. These systems allow pieces to evolve separately, scale dynamically, adapt quickly yet each request between parts can carry private details through layers unseen. As services team up to assemble answers, personal fragments pass across boundaries, often beyond clear oversight. Exposure risks grow quietly with every added link in the chain.

This study introduces a framework designed to protect privacy when combining APIs within microservices systems. Protection comes through several overlapping methods - encryption that resists breaches, tokens verifying user identity, hiding sensitive values, along with techniques merging data without exposing individual records. Sitting at the core, an API gateway manages how services communicate, making sure privacy rules are followed each time requests move through and responses form.

Beginning with compliance, the setup takes into account legal requirements including GDPR. Built on Spring Boot, an early version shows added privacy features bring a noticeable but limited slowdown - around 7 to 10 percent in delay. Performance tests imply stronger data protection does not necessarily come at the cost of much slower operations.

KEYWORDS: *Microservices, API Composition, Data Privacy, Distributed Systems, Encryption, Differential Privacy, API Gateway*

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