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Practical Approach to Design and Implement a P2P and E2EE Instant Messaging System

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As the internet became more and more globally accessible, so did messaging systems become more popular. Starting with mailing lists, IRC (Internet Relay Chat) channels and then evolving into instant messaging applications, the privacy aspect of the communication became an ever increasing concern when it comes to such applications. Many related applications and research studies tackle the problem of privacy with different approaches. The current article discusses the challenges in designing an open source, P2P (peer-to-peer) and E2EE (end-to-end encrypted) instant messaging system and offers technical details on how to implement and design a working proof of concept that allows message exchanges in real-time. The implemented proof of concept solution offers private conversations, while requiring no central servers or data silos, all the data is user hosted.

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