

Secure Collaborative Editing over Low-Cost Cloud Storage Services

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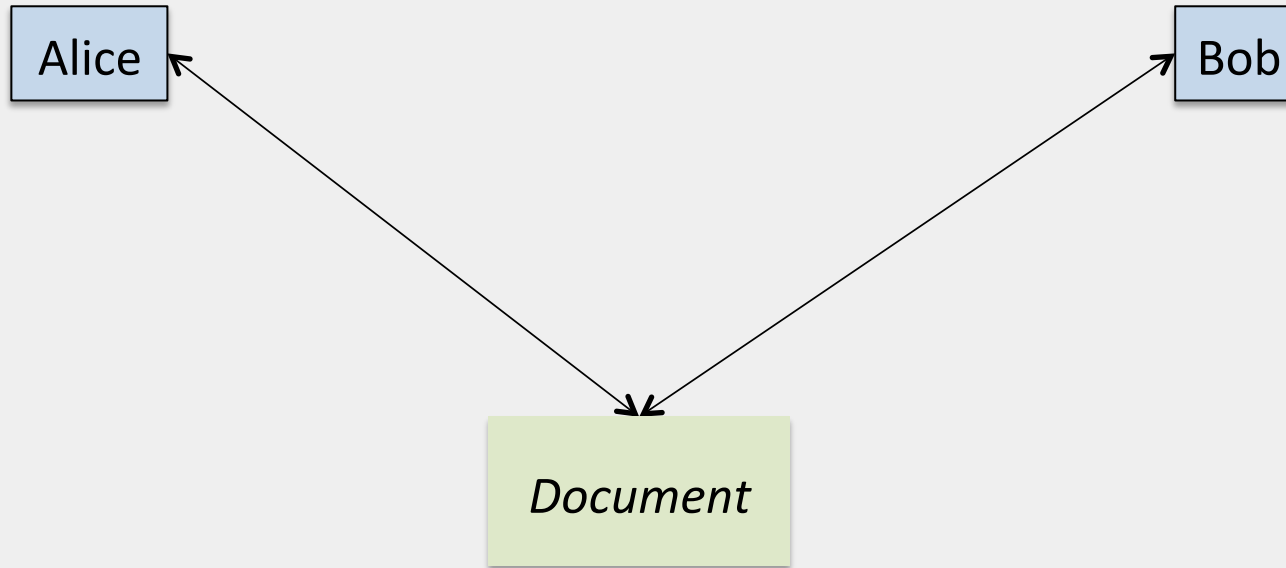
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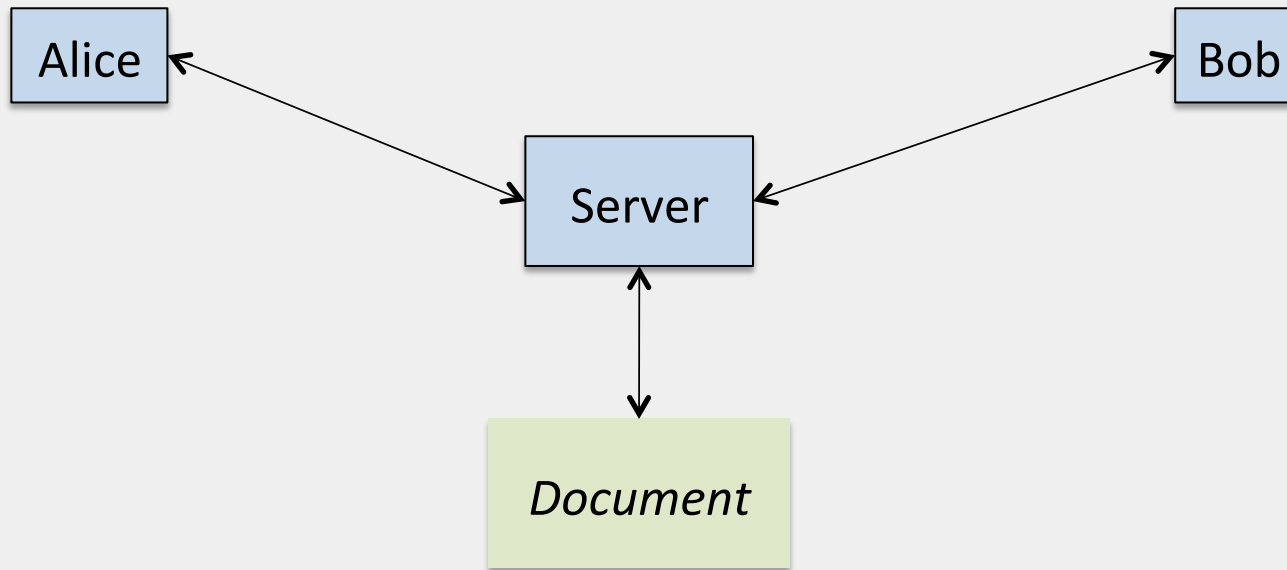
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Secure Collaborative Editing



Alice and Bob want to collaboratively edit a document in real-time.

Secure Collaborative Editing



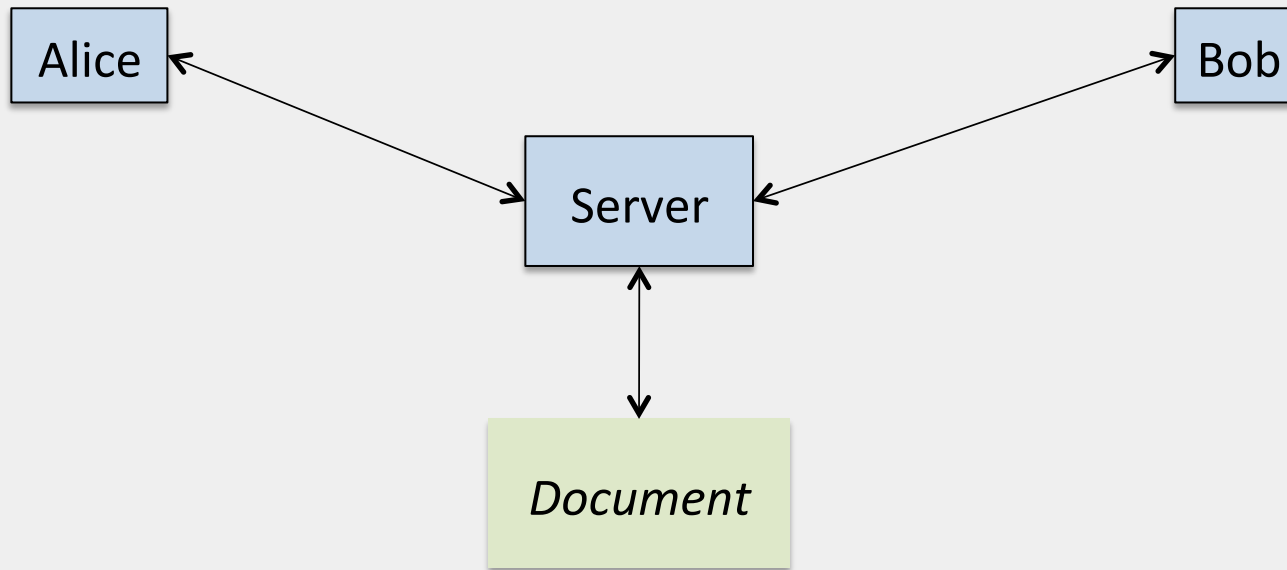
Centralized Server setting.

Secure Collaborative Editing



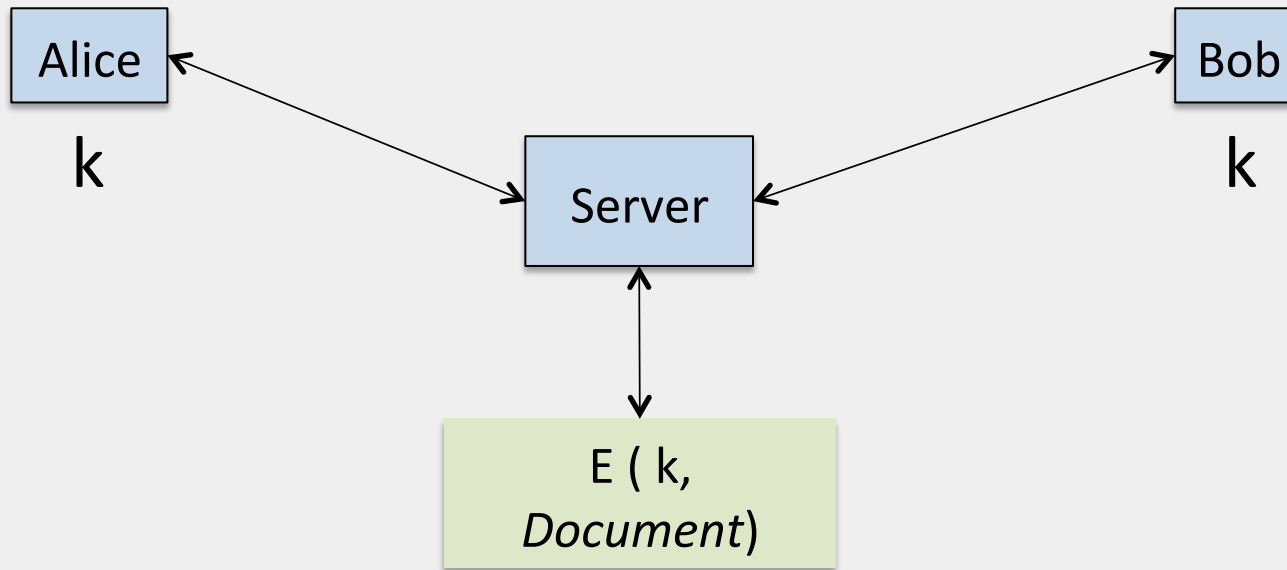
Peer-2-peer setting.

Security Requirement



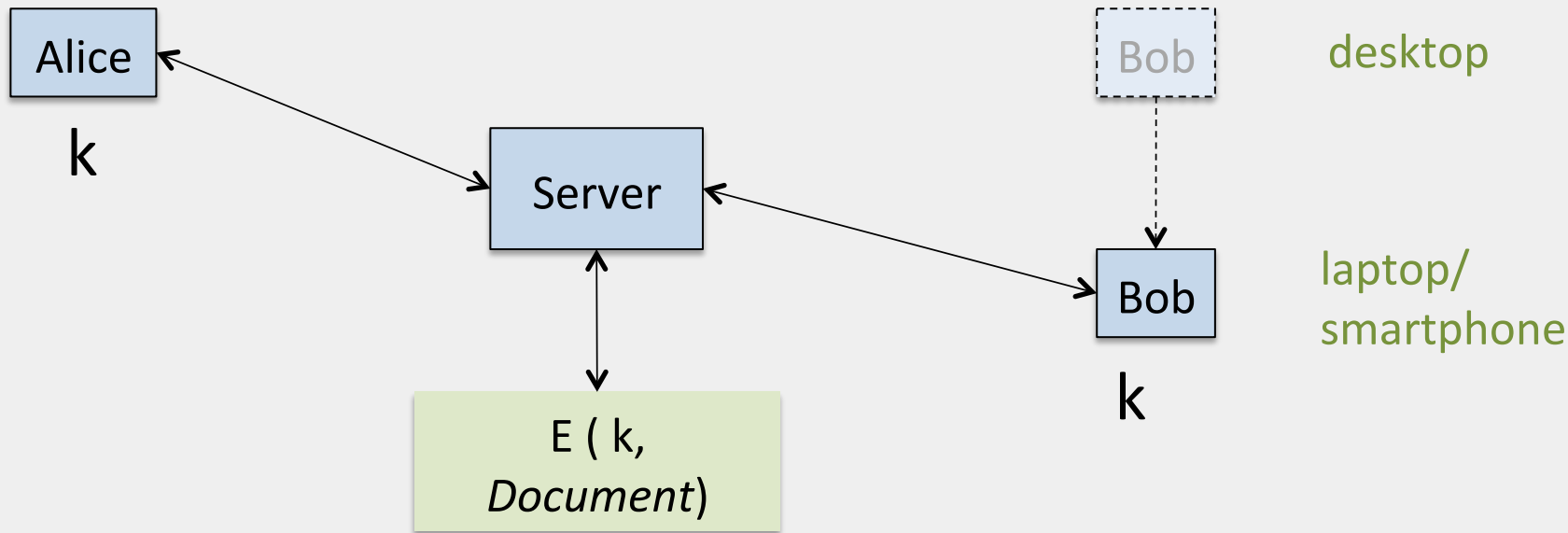
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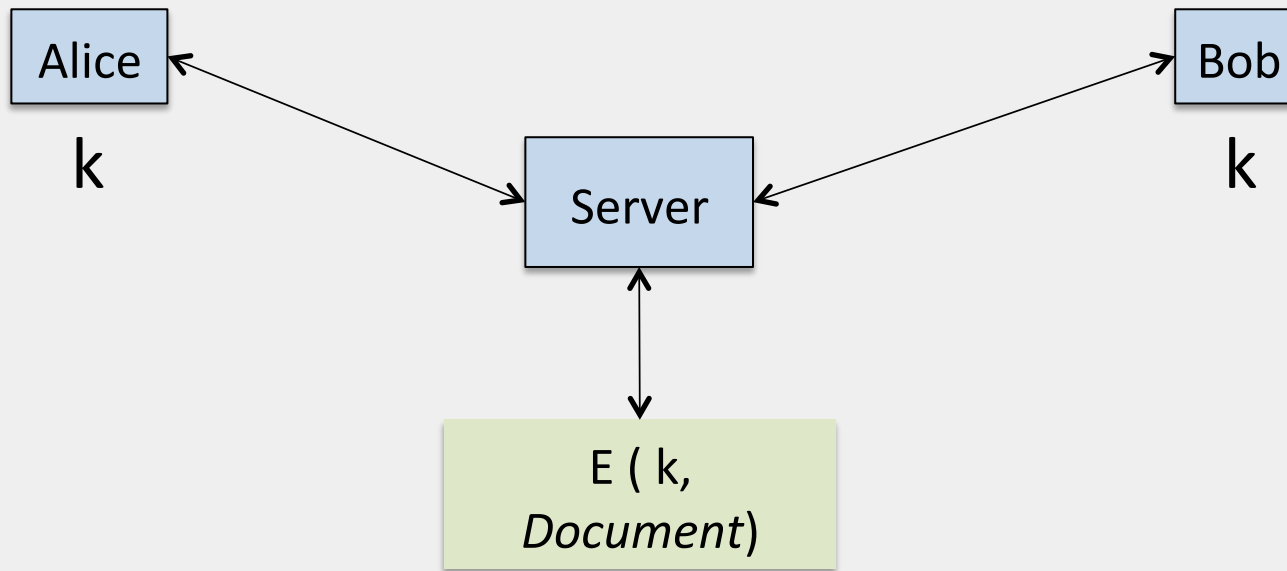
Mobility Requirement



Bob carries out the editing session using different devices. Hence, Bob's devices are "stateless".

Different to be realized in peer-2-peer setting.

Low-cost storage service



Server provide generic storage services
(read, write, delete a file and directory listing)

- No server-side processes dedicated to an editing session.
- Low bandwidth, not guarantee on latency.

Our approach

- While the authors collaboratively edit the whole document, they seldom edit a small region concurrently.
- Relax the real-time requirement to “quasi-real-time”.
- Documents are automatically broken into pieces. The client-side editor manages “locking” automatically and provides a quasi-real-time editing experience.

Implementation & experiment

- A Proof-of-Concept implementation over Dropbox.
- User studies shows that it is effective (70% of time required compare to turn-based editing) and efficient.