SECUREDROP

Introducing the SecureDrop Protocol

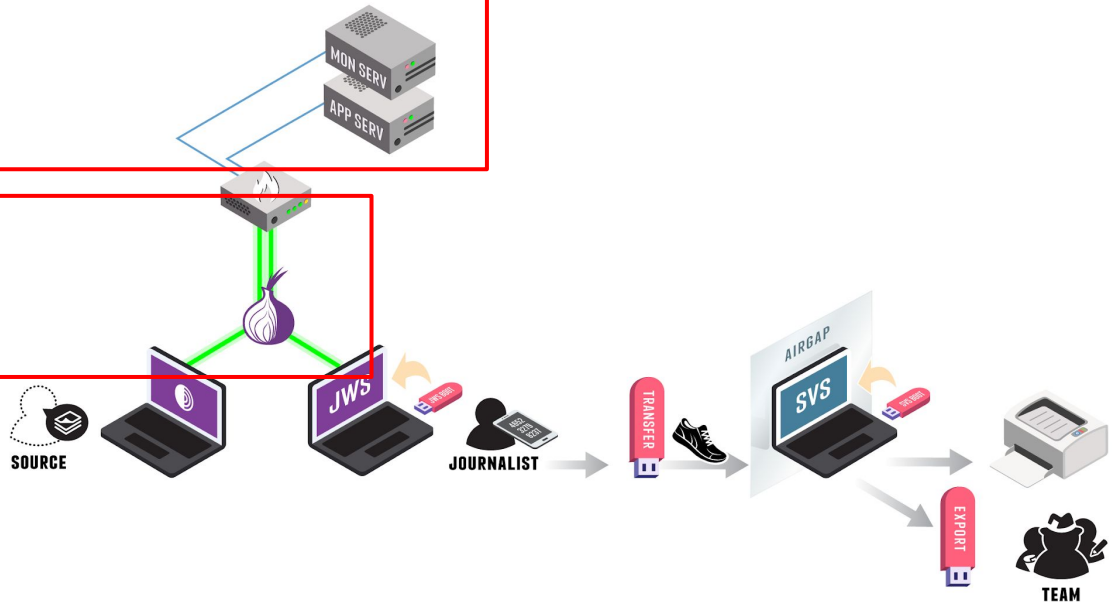
IETF 120

Giulio Berra • Freedom of the Press Foundation

SecureDrop today: architecture

OpenPGP encryption
at rest

Tor encryption
in transit



E2EE SecureDrop: goals

- Use modern end-to-end encryption
- Do not require file or information persistence on the source/whistleblower side
- Ensure system architecture does not preclude deployment in a hostile, potentially compromised environment
- Avoid, minimize, and hide metadata from the server

E2EE SecureDrop: non-goals

- High volume, high traffic
- Low latency
- Arbitrary-sized groups
- Arbitrary direct messages
- Federation

E2EE SecureDrop: properties

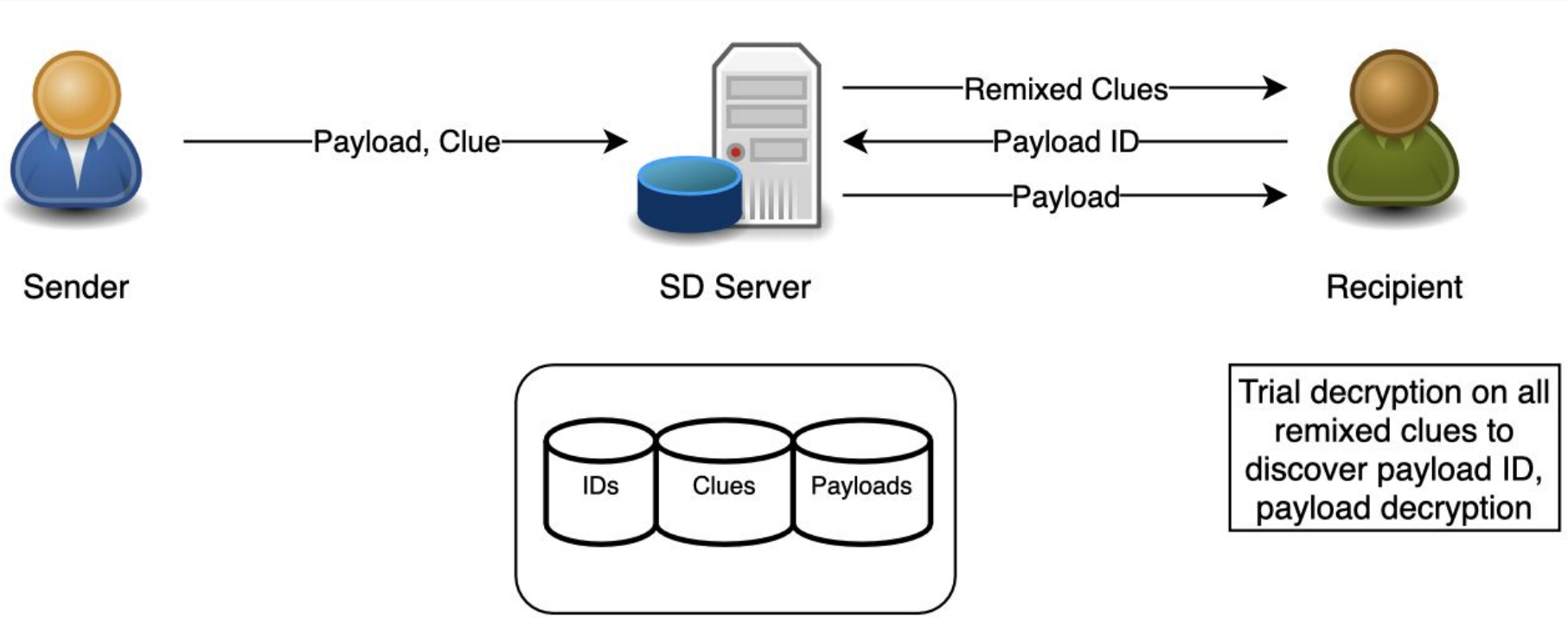
1. No accounts, and therefore no user authentication
2. No message flow metadata
3. No changes in server state are observable externally
4. No ciphertext collection or information leaks

Comparison of E2EE messaging protocols

Approach	Primitives Library	Peer-reviewed Library	Groups	Scalable	Concealed Recipient	Private Server State	Avoids Accounts
Signal	Yes	Yes	Yes	Yes	No	Yes	No
Trial Decryption	Yes	N/A[1]	Yes	No	Yes	No	Yes
Oblivious Message Retrieval	No	No	Yes[2]	Yes	Yes	No	Yes
SecureDrop Protocol	Yes	No	No	No[3]	Yes	Yes	Yes

1. While there isn't a single standard library, the implementation is straightforward.
2. New iteration of the research focuses on groups.
3. SecureDrop Protocol does not preclude scalability, but scaling to mass adoption level (i.e. millions of users) is a nonrequirement for our purposes.

E2EE SecureDrop: high-level flow



E2EE SecureDrop: follow-up questions

- **Most whistleblowing software/services have a similar setup: web-based and single server**
- Could a stable, maintained library improve the ecosystem? Even the commercial ones?
- Is the threat model accurate, realistic, and broad enough?
- Is the protocol portable in a PQ world? (3-party commutative DH is not trivial)
- What other countermeasures are needed? Decoy/noise traffic?

Acknowledgments and ongoing work

- **Preliminary cryptographic audit** done by Michele Orrù (French National Center for Cryptographic Research/ CNRS)
- **Funded** by the Filecoin Foundation for the Decentralized Web
- **Formal analysis** in progress by Luca Maier supervised by Felix Linker (Swiss Federal Institute of Technology/ETH Zürich)

Our ask: your feedback

Read more:

- https://securedrop.org/news/introducing-securedrop-protocol/
- https://github.com/freedomofpress/securedrop-protocol

Write to us:

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