draft-mcmillion-keytrans-architecture

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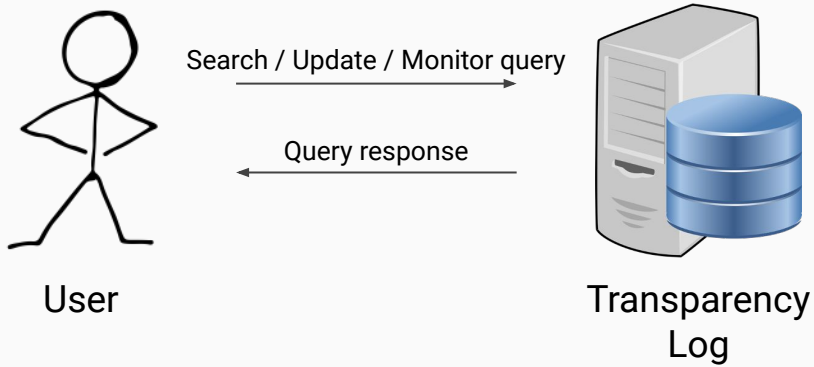
Section 1:

Parts of the Draft that People Seem Fine With

Basic Model

1. **Search:** What's the value of this key?
2. **Update:** Here's a new value for this key!
3. **Monitor:** What's new with my keys?

- Looks like a key-value database
- Transparency Log enforces access control rules by simply rejecting queries that aren't allowed
- User (generally) only needs direct communication with the Transparency Log

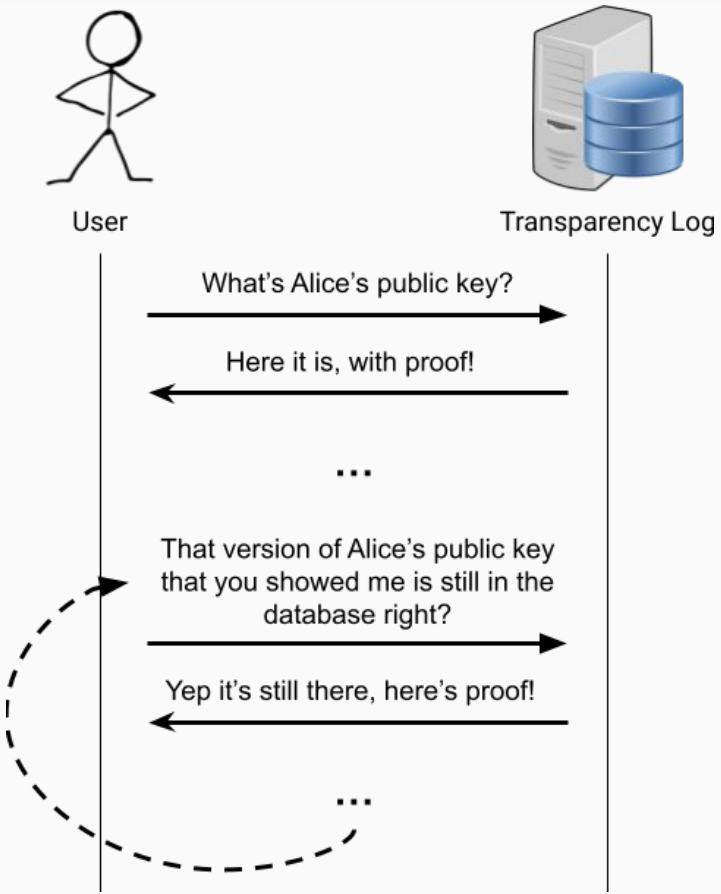


Deployment Modes

Name	Applications that Generally Follow this Pattern
Contact Monitoring	Google KT Apple iMessage KT
Third-party Auditing	WhatsApp KT
Third-party Management	Certificate Transparency Merkle Tree Certificates

Supports a wide range of use-cases

1. Contact Monitoring



2. Third-party Auditing

Many users

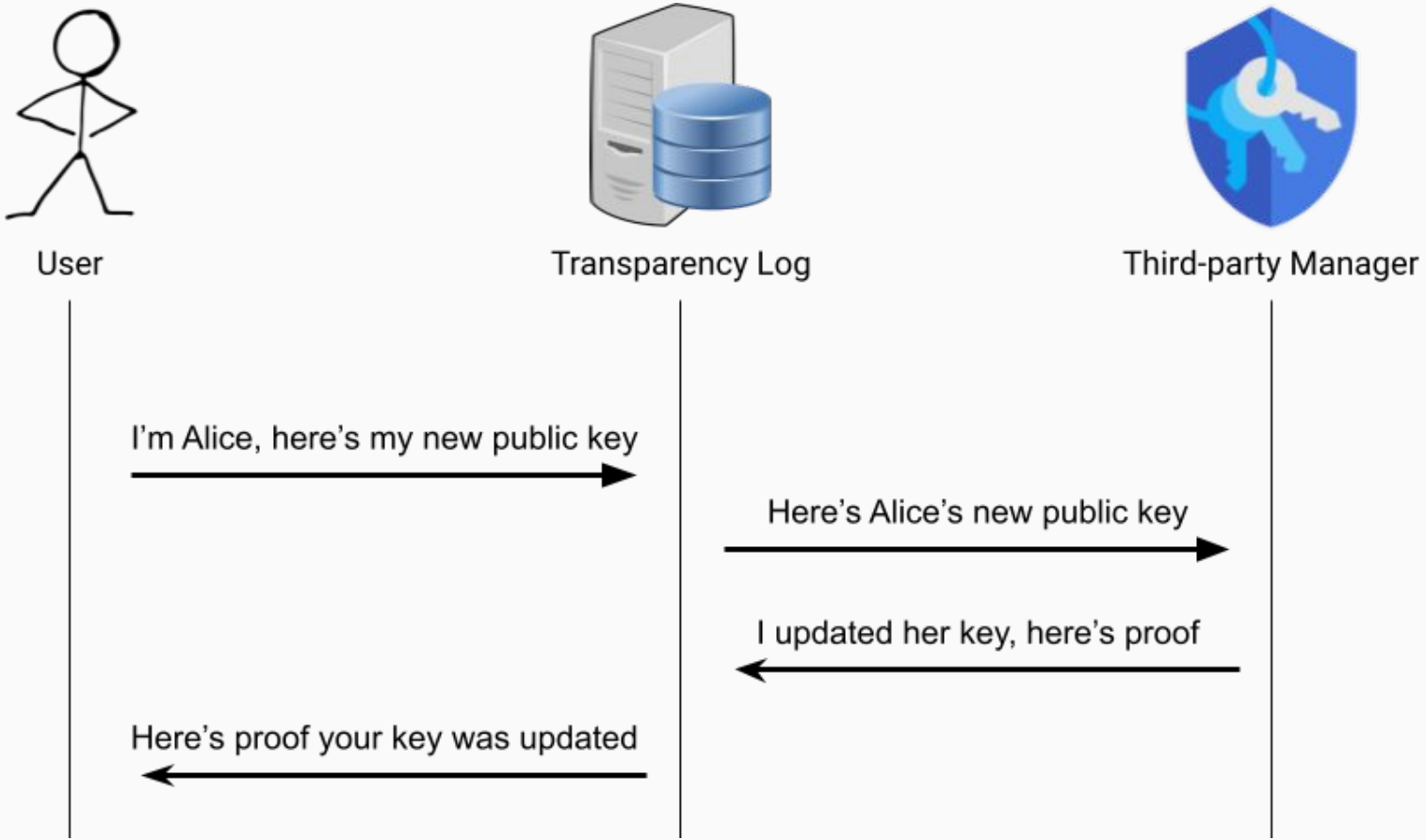
Transparency Log

Third-party Auditor

Here's a list of all the changes I made to the database today!

Looks like you did everything right, here's a signature saying that

3. Third-party Management



Out-of-Band Communication

Peer-to-Peer Gossip:

- Manual, low bandwidth
- Envisioned as users scanning QR codes

Anonymous Channel:

- Automated!
- Envisioned as fetching a tree head over an anonymous network

- **Important Point #1:**
  Out-of-band communication is always about *tree heads*, and never individual users

- **Important Point #2:**
  Gossiping effectively requires having a linearizable view (next slide!)

“Linearizable View”

- Users remember the most recent tree head they’ve observed and require future queries to be provably consistent against that tree head

- **Implies:** At minimum, a constant-size amount of state

- **Benefit:**
  - Makes out-of-band communication much more effective
  - In third-party auditing: Allows immediate updates despite auditor lag

(We’ll discuss this more later)

(Intermission)

Section 2:
Feedback from the Mailing List

Missing Sections

- Support for Sealed Sender
- Discussion of how federation would work
- Discussion on privacy law compliance / compelled deletion of user data

Immediate Updates?

- Currently the draft states that requested changes are applied **immediately**
- **Implies:** No ‘interim’ inclusion proofs (similar to SCTs)
- **Benefits:**
  - Simplifies protocol description and operation
  - Supports deployments that want a ‘strict’ KT regimen
- Deployments that don’t trust their KT server’s reliability / performance seem to have sufficient other risk-reduction strategies

Questions?
Thoughts?