Let's Encrypt

A FREE CERTIFICATE AUTHORITY TO ENCRYPT THE ENTIRE WEB

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ACRONYMS

- SSL (Secure Sockets Layer) – the old name for the main security layer for TCP
- TLS (Transport Layer Security) – the modern name for SSL
- HTTPS (HTTP Secure) – HTTP plus TLS X.509 – the format used by TLS certs
- PKI (Public Key Infrastructure) – an infrastructure for distributing crypto keys

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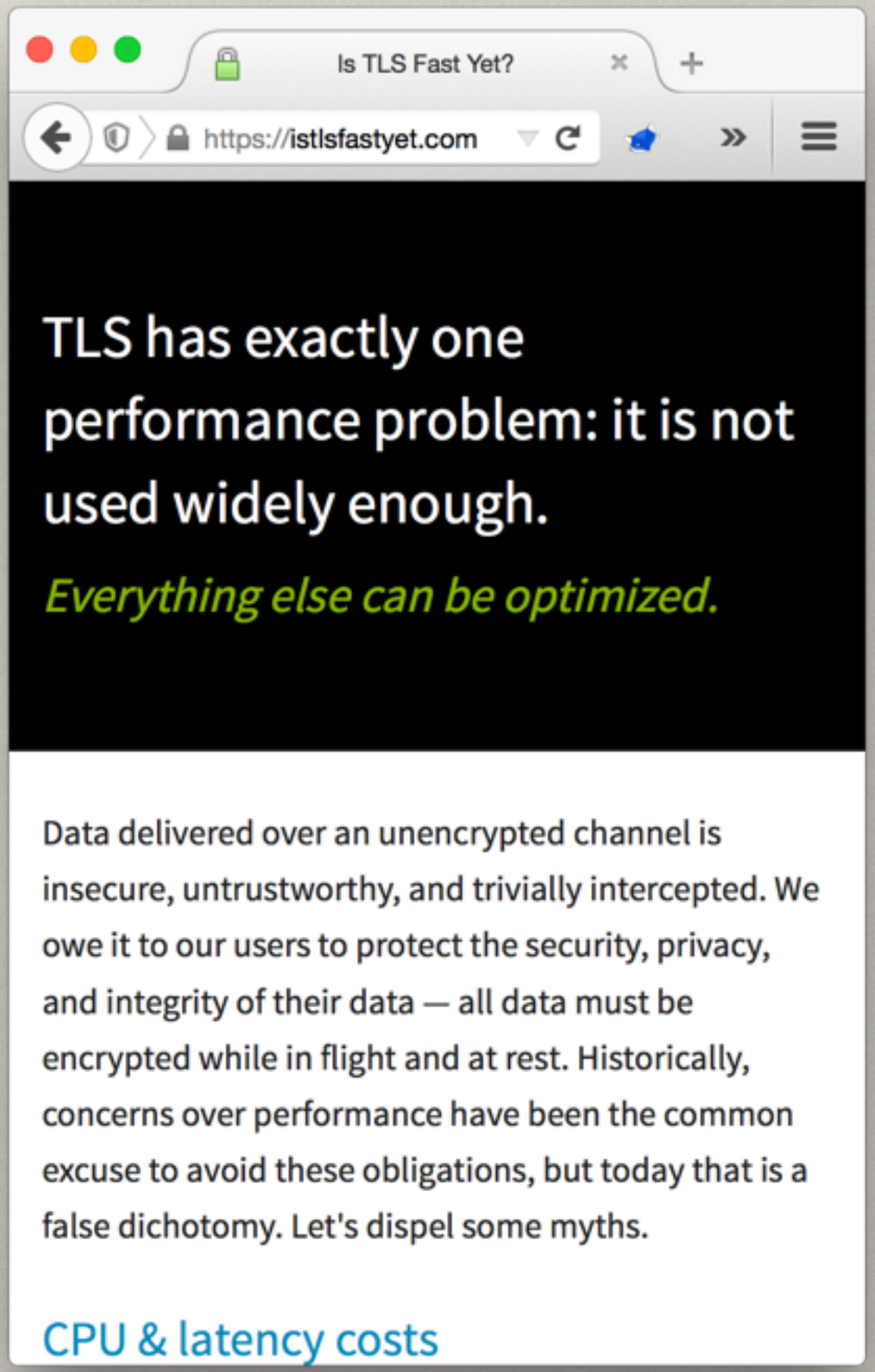
- **Plain HTTP offers no defense**
- Sidejacking
- Location tracking
- Reader privacy
- Content-based censorship
- ISP header or advertisement injection

HANGUPS

- Lower performance
- Inhibiting load balancing
- Certificates cost money
- It is time consuming, error-prone and complex to install certificates correctly

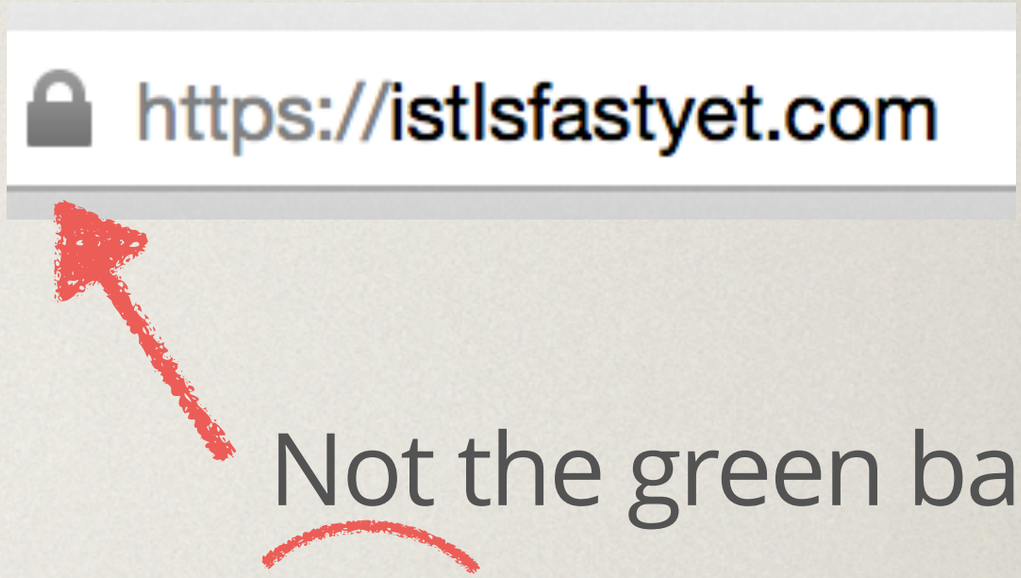


LET'S ENCRYPT

- Initially, a collaboration among EFF, University of Michigan, and Mozilla
- Fully-automated Certificate Authority
- Publicly trusted in all major web browsers

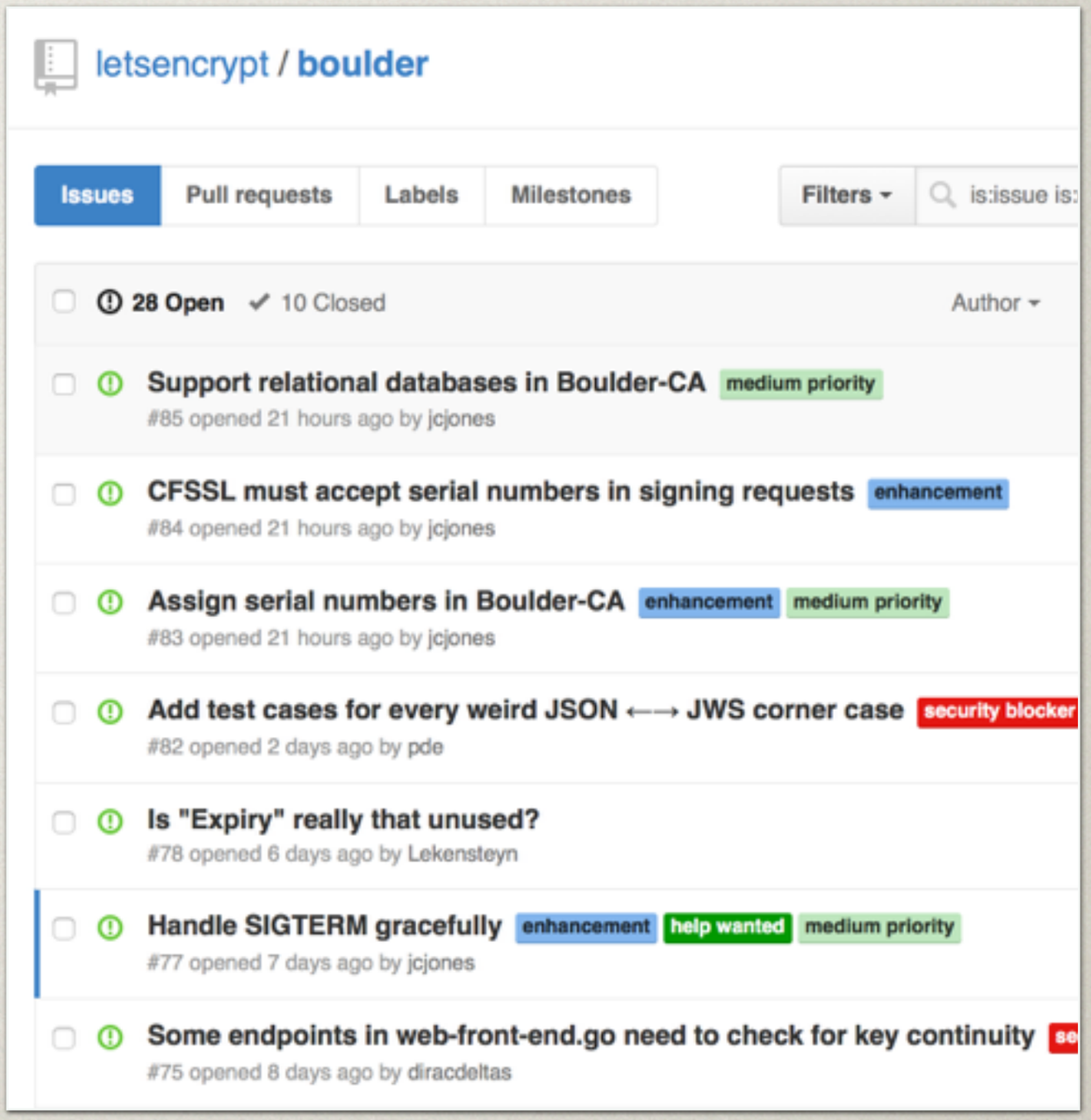
DOMAIN VALIDATION

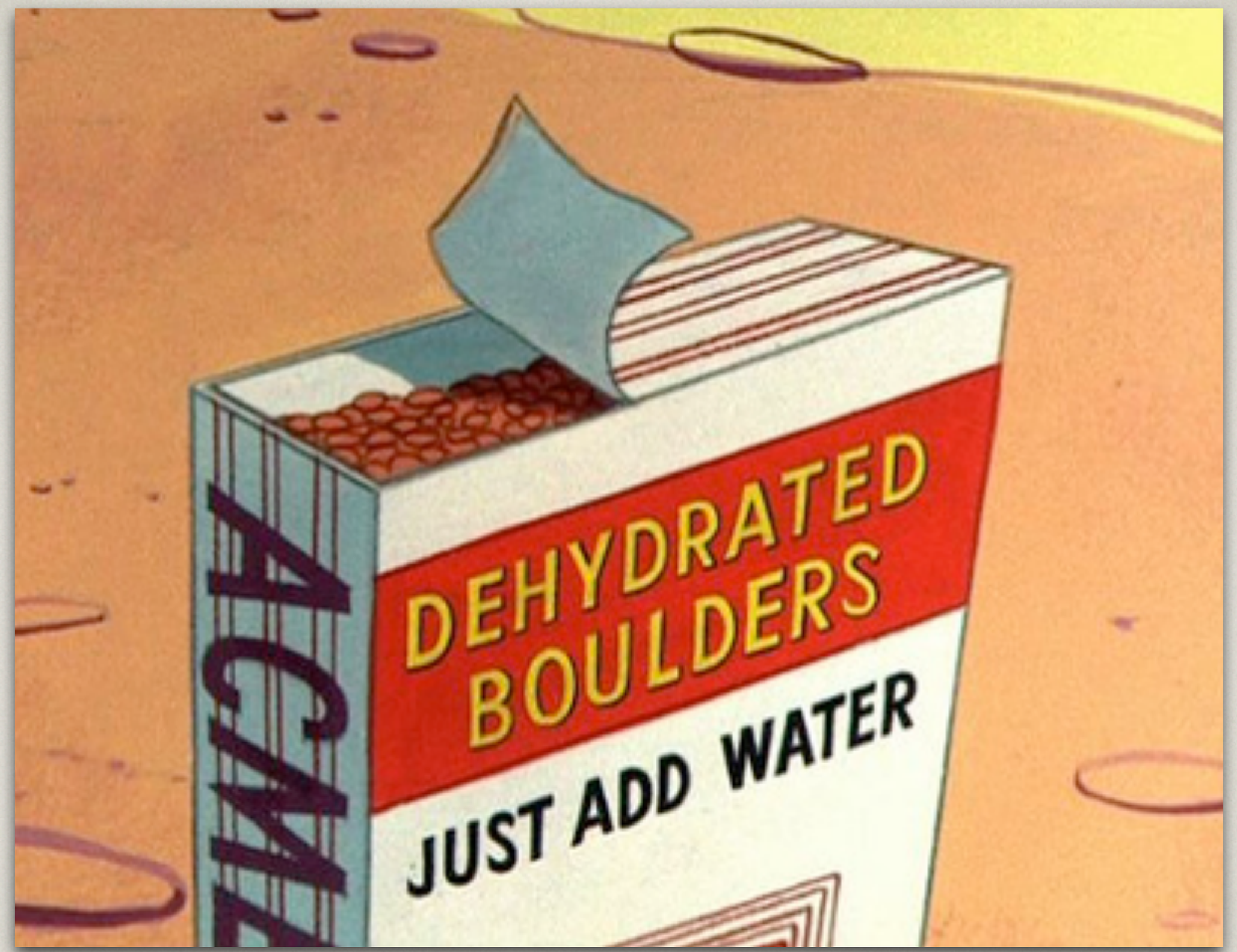
- The free certificates attest that the applicant controls the domain
  - OV and EV are out of scope for now
- Attesting domain control is ripe for automation



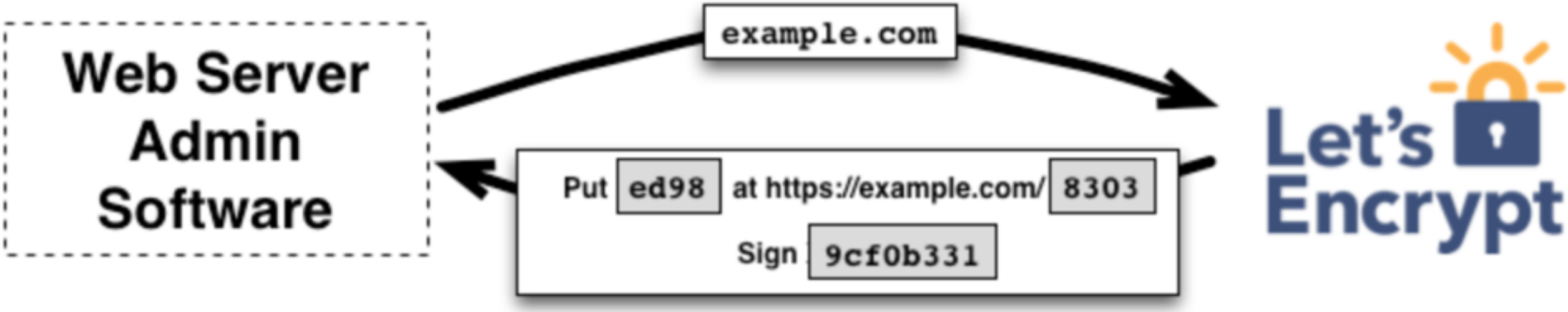
PUBLICLY TRUSTED

- Comply with all WebTrust audit requirements
- Open source software and specs
- Open Audits / Publication
- Browser root programs
- Cross-signatures from IdenTrust

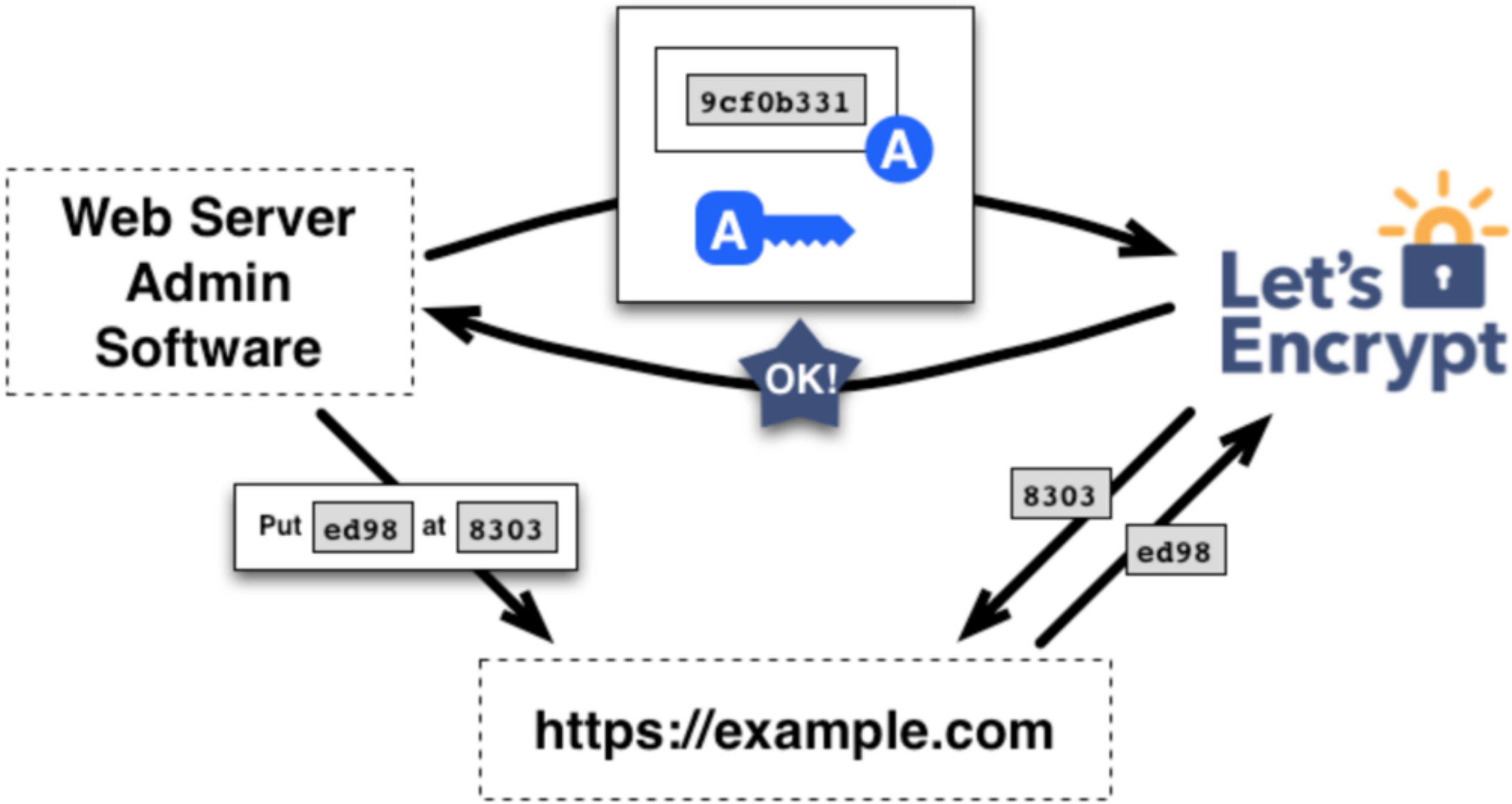




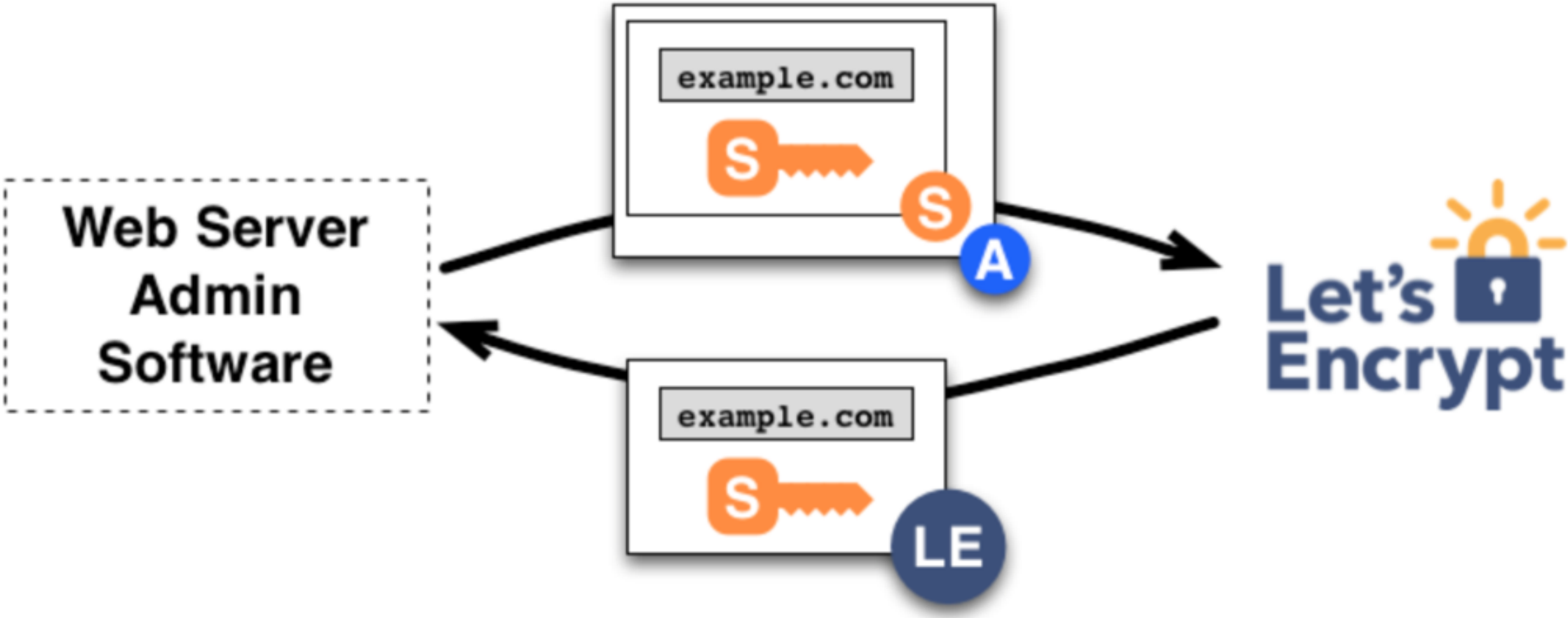
ACME



DOMAIN REGISTRATION



DOMAIN VALIDATION



CERTIFICATE ISSUANCE

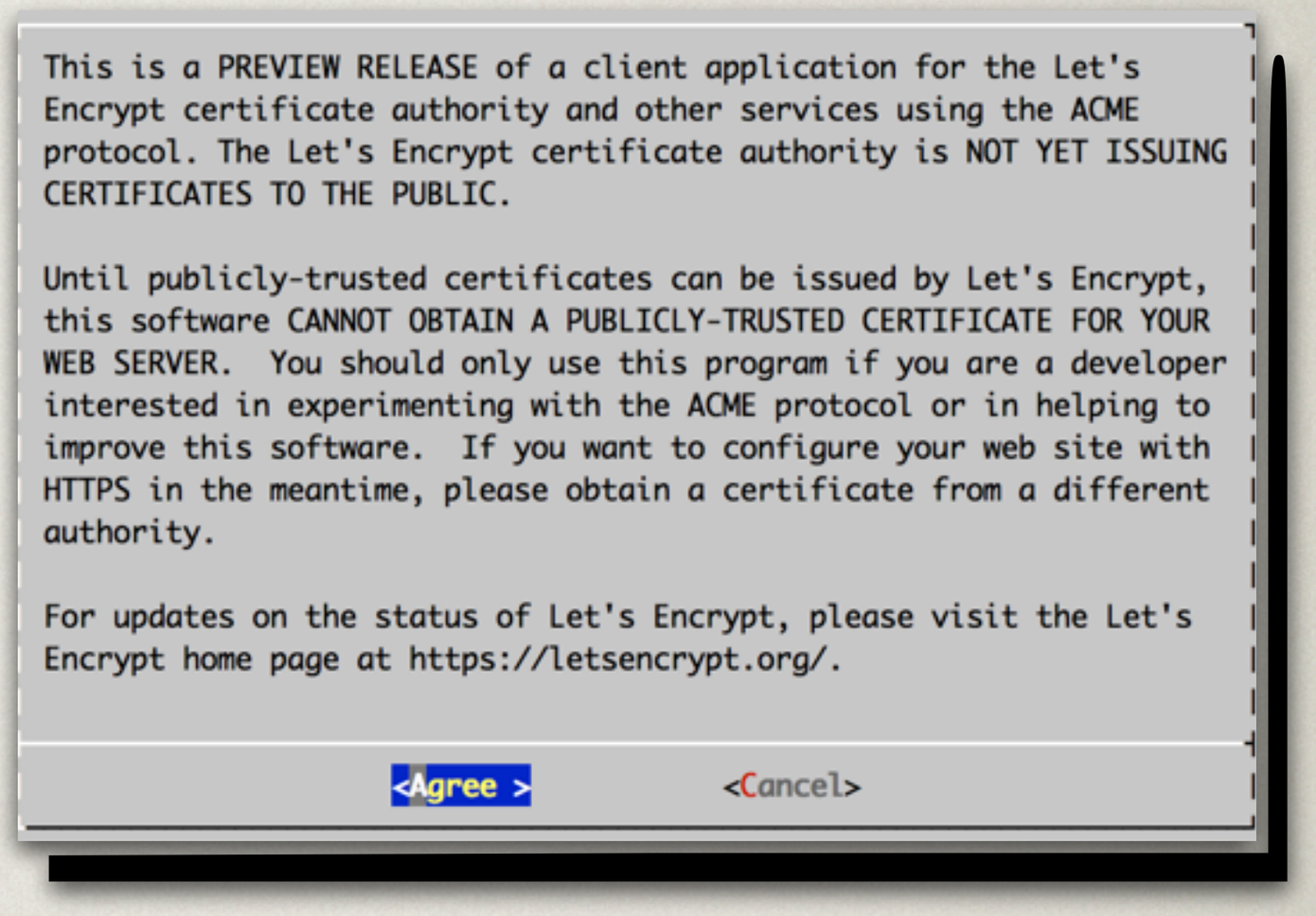
ACME CONVENIENCE

- We anticipate people who administer their own web servers will run something like
  - `sudo apt-get install lets-encrypt`
  - `sudo lets-encrypt`

  and the lets-encrypt client will not only obtain, but also deploy, the new cert in less than one minute

FUTURE

- ACME is on the path to being an RFC
- Foresee integration into all web servers and application hosting platforms
- Free and open



THANKS, GATORLUG!

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CHALLENGES AND RESPONSES

- Source code: https://github.com/letsencrypt
- ACME spec: https://letsencrypt.github.io/acme-spec/