Public key distribution for signed Eiffel events

2024-04-25

Eiffel

Agenda

Quick Eiffel event signing primer

Problem statement

Possible solutions

Why sign events?

Events are usually published on a shared message bus with multiple contributors.

Many event types are inherently sensitive, like those announcing artifact locations.

Signing events allows authentication of senders.

(It also ensures the integrity of the events is maintained.)

Ecosystem support

.NET SDK (sort of)

Go SDK (soon)

eiffel-broadcaster Jenkins plugin (now)

Structure of a signed event

```
{
  "meta": {
    "security": {
      "authorIdentity": "CN=joe,DC=example,DC=com",
      "integrityProtection": {
        "alg": "ES256",
        "signature": "b25zIDI0IGFwciAyMDI0IDIxOjQ0OjM0IENFU1..."
      }
    }
  },
  ...
}
```

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Signing how-to

```
event.meta.security.authorIdentity = "CN=joe,DC=example,DC=com"
event.meta.security.integrityProtection.alg = "ES256"
event.meta.security.integrityProtection.signature = ""
event.meta.security.integrityProtection.signature =
    sign(private_key, sha256(canonical_json(event)))

sig = event.meta.security.integrityProtection.signature
event.meta.security.integrityProtection.signature = ""
verify(public_key, sig, sha256(canonical_json(event)))
```

But which public key should we use to verify an event's signature?

Use existing meta.security.integrityProtection.publicKey

Bundling the public key in the event itself protects against corruption, but doesn't authenticate the sender.

If new publishers could send a "bootstrap" event with the key they intend to use this could be picked up and saved for later.

Introduce meta.security field for certificate

If the event includes a certificate signed by a CA accepted by the consumer, this will be enough to authenticate the event.

The certificate’s subject would be required to match meta.security.authorIdentity.

Configuration in each consumer

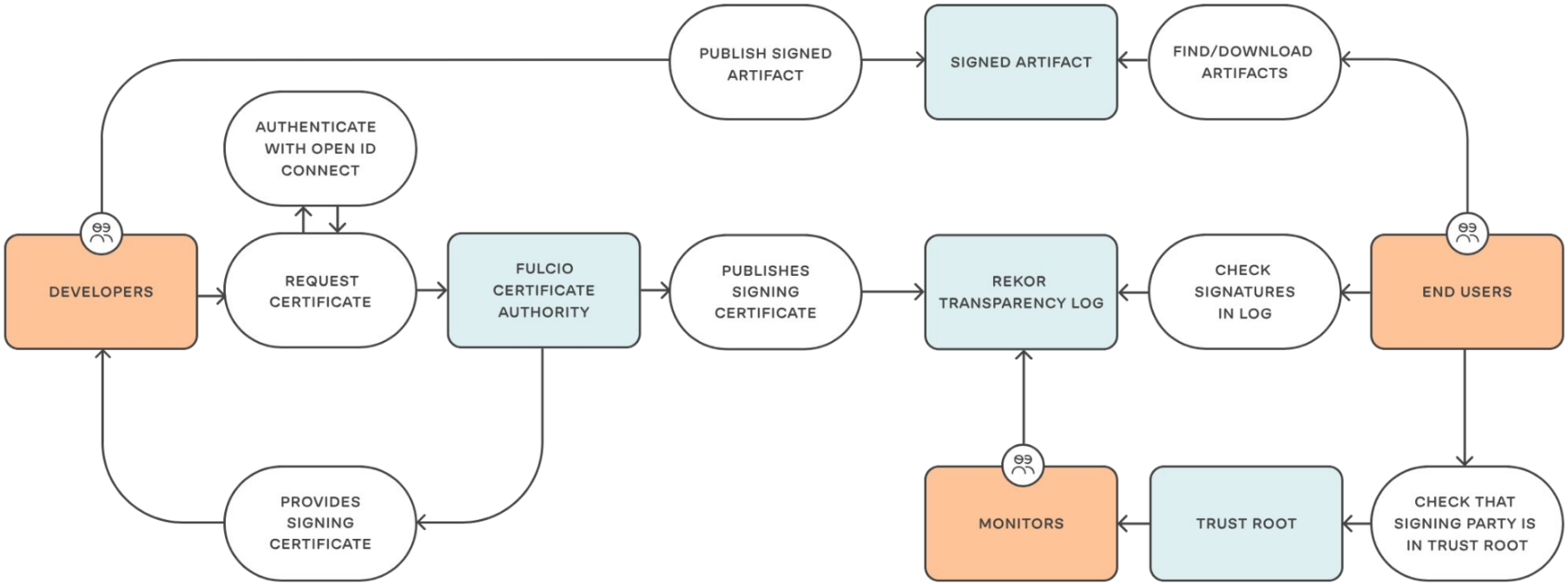
Each consumer would be configured with a list of (event sender DN, public key) mappings.

Shared configuration

There's a common configuration source where all consumers can look up event sender DNs and get public keys.

- One or more files in a git repository.
- A web service or similar API.

Use the Sigstore toolbox



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