Power of Attorney based device onboarding

Draft: https://datatracker.ietf.org/doc/draft-vattaparambil-iotops-poa-based-onboarding/

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PoA overview

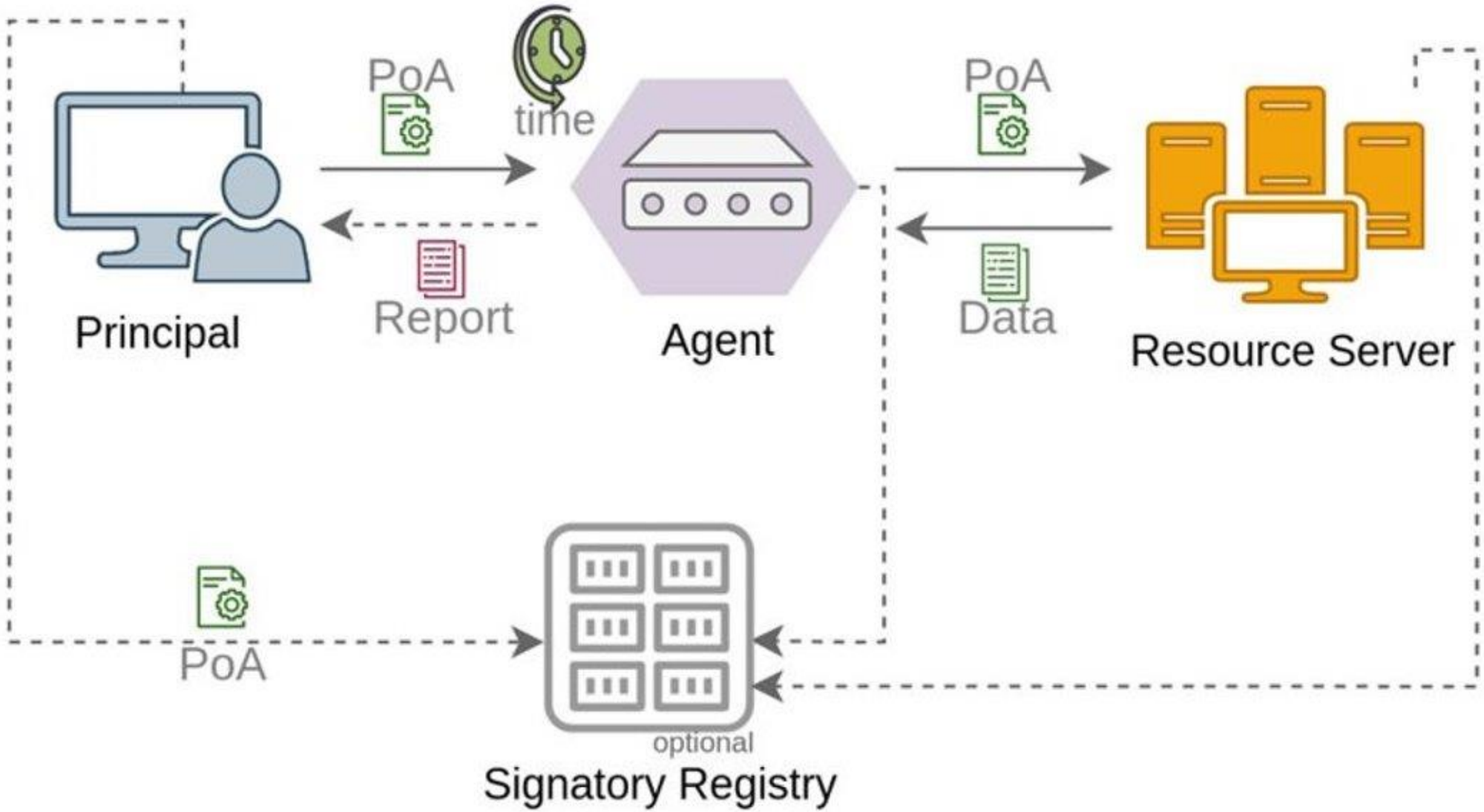
- We propose Power of Attorney (PoA) based authorization
  - PoA is a digital document that the principal signs and directs to an agent
- To authorize entities (e.g., semi-autonomous devices) with an identity (called agents) to act on behalf of a resource owner (called principal)
  - Includes detailed credentials and expiration time

PoA properties

- Self-contained and decentralized (e.g., like PGP)
  - May be supported by optional signatory registry
- Separation in time between signing of a PoA and acting upon it
  - The principal may not be online or available when the PoA is used
- Enabling multi-level subgranting (delegation)
  - e.g., "I give you a quite general master PoA, on which you can generate other, typically more specific PoAs (chain of PoAs)"
- Can contain additional integrity info such as device/software hashes

PoA-onboarding motivation

- Onboarding must be administratively scalable (eg: industrial site)
- Site owner must have a secure method to delegate onboarding credentials to subcontractors and integrators
  - so they can onboard their devices permanently or temporarily to a target network
- Onboarding should not require all parties in the trust chain to be online
- Onboarding should not necessarily involve transfer of ownership


PoA
time
PoA
Principal
Report
Agent
Data
Resource Server
PoA
optional
Signatory Registry

PoA approach for onboarding

- Establish trust chains between the target network owner and subcontractors for **automatic onboarding** of devices
- Then between **subcontractor** and their devices
- At onboarding, the **ownership** of the device may be kept by the subcontractor
- PoA from the target network owner ensures policies for subcontractors to submit devices for onboarding
- PoA from the subcontractor to devices ensures that only devices that work on behalf of a subcontractor can onboard.

- Together providing efficient and effective onboarding of devices to a target network.
  - Scalable and secure
  - Time limited as desired
  - Authorization credentials
  - Low management overhead

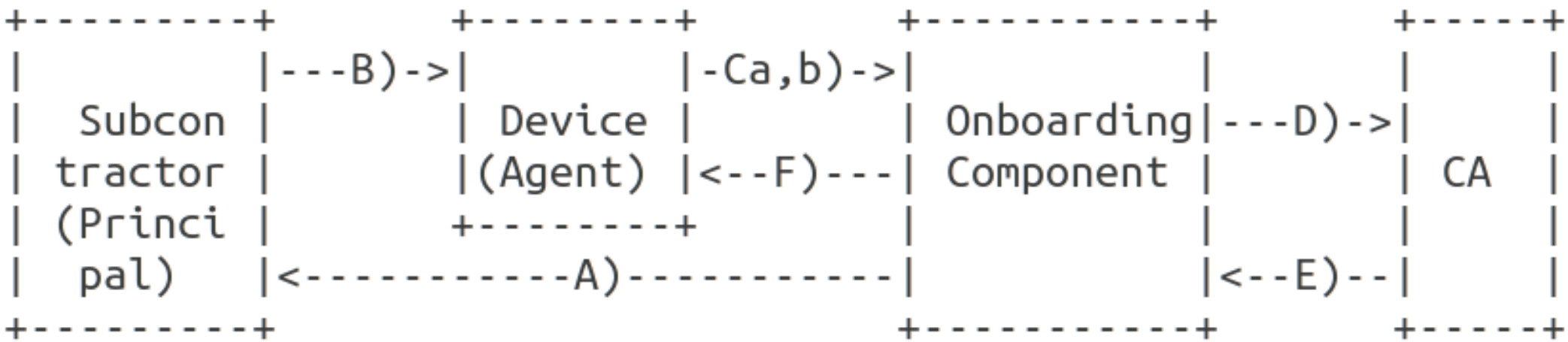
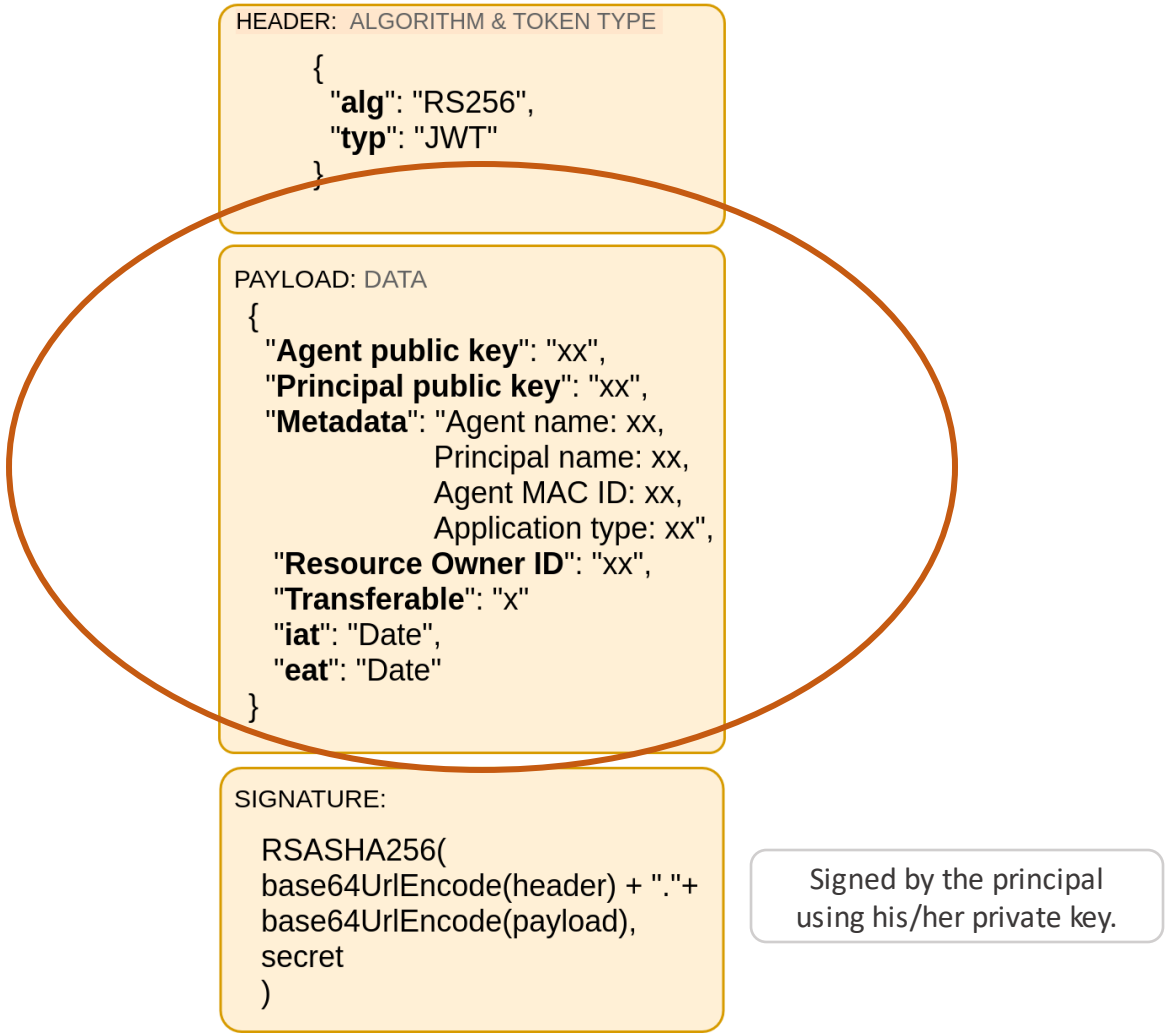


Fig 1: Protocol flow of PoA based onboarding

PoA structure



Implementations

- To enable PoA execution in any system:
  - Open-source library
  - Trustworthy downloadable image (e.g., docker image)
  - PoA integration with OAuth

- Draft: "poa-based-onboarding"

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- Review and comments from WG
- Thank you! More questions?
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