Chained and Delegable Authorization Tokens

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UAB

Outline

1. Introduction
2. Example
   - Initialization
   - Token delgation
   - Chain delegation
3. Delegation in CADAT
4. Implementation and Applications
   - Implementation
   - SPKI cert without using full tag intersection
   - SPKI cert using full tag intersection
5. Conclusions

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Chained And Delegable Authorization Tokens

- Hash chains as chains of authorization tokens.
  - tokens represent generic authorizations (not just micropayments).
- Delegation
  - delegation of chains or subchains.
- Implemented with a **trust management** infrastructure.

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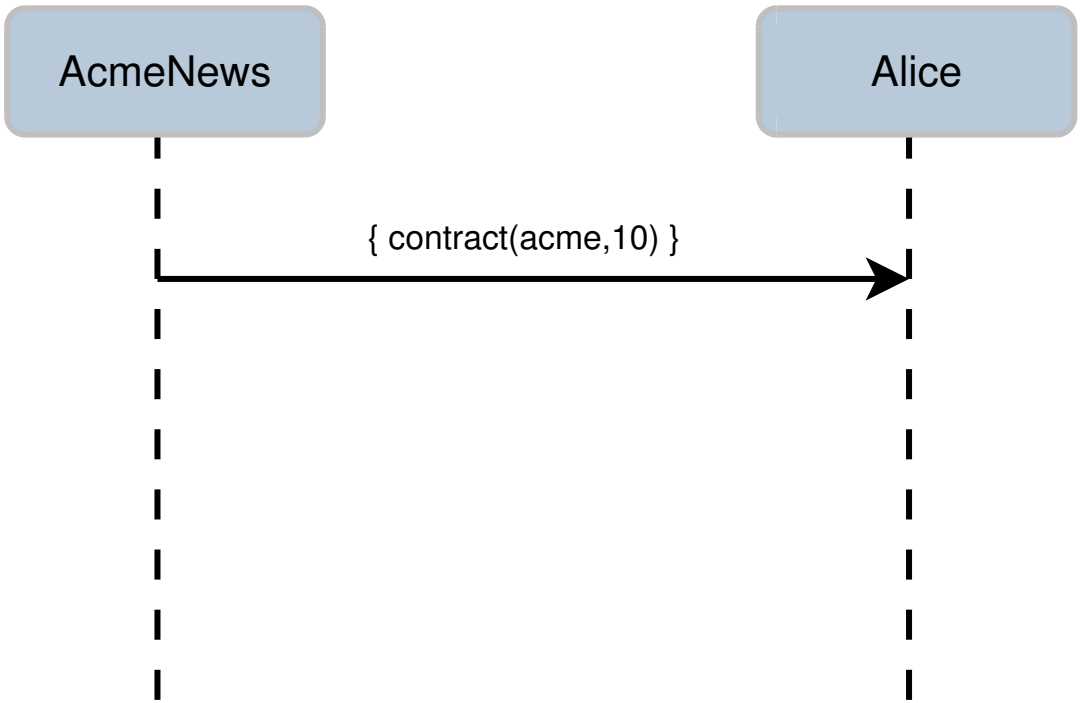
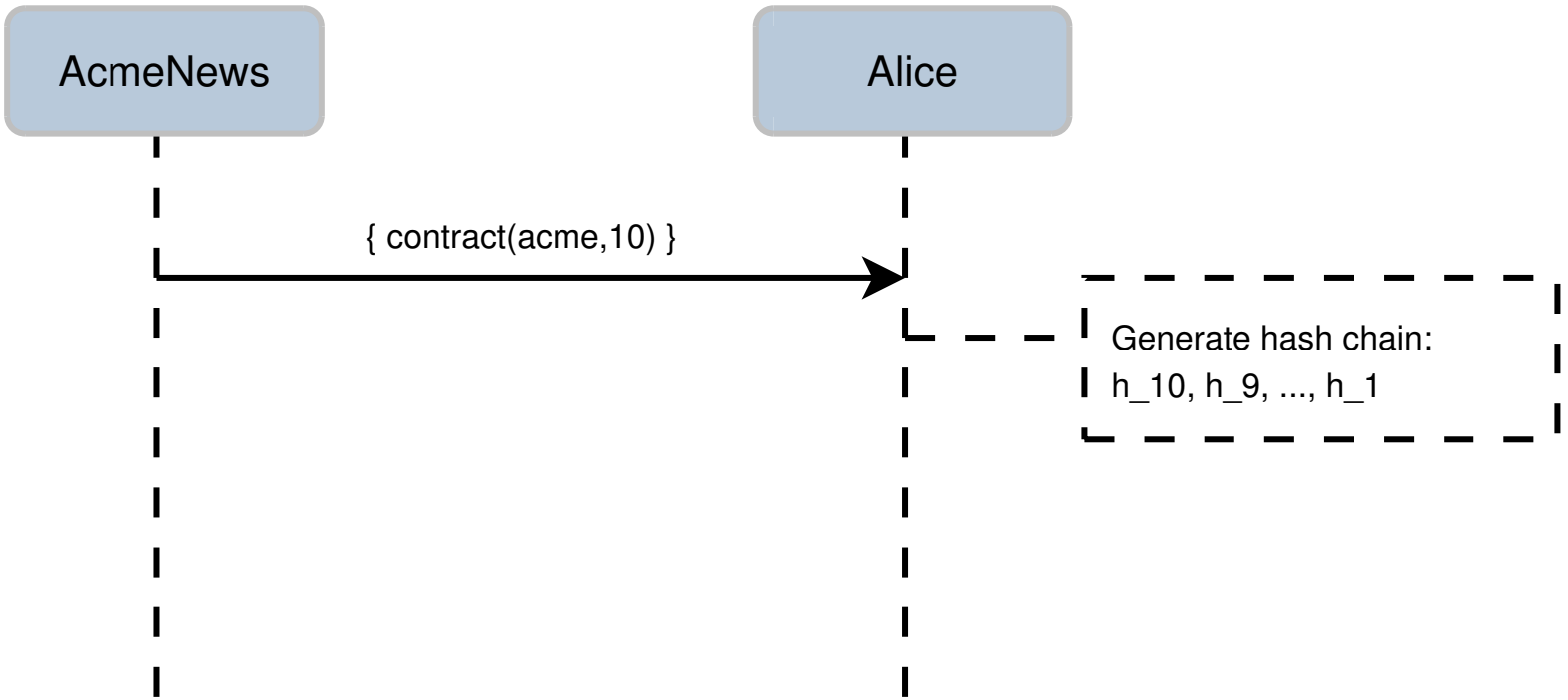
Example: first use



Example: first use



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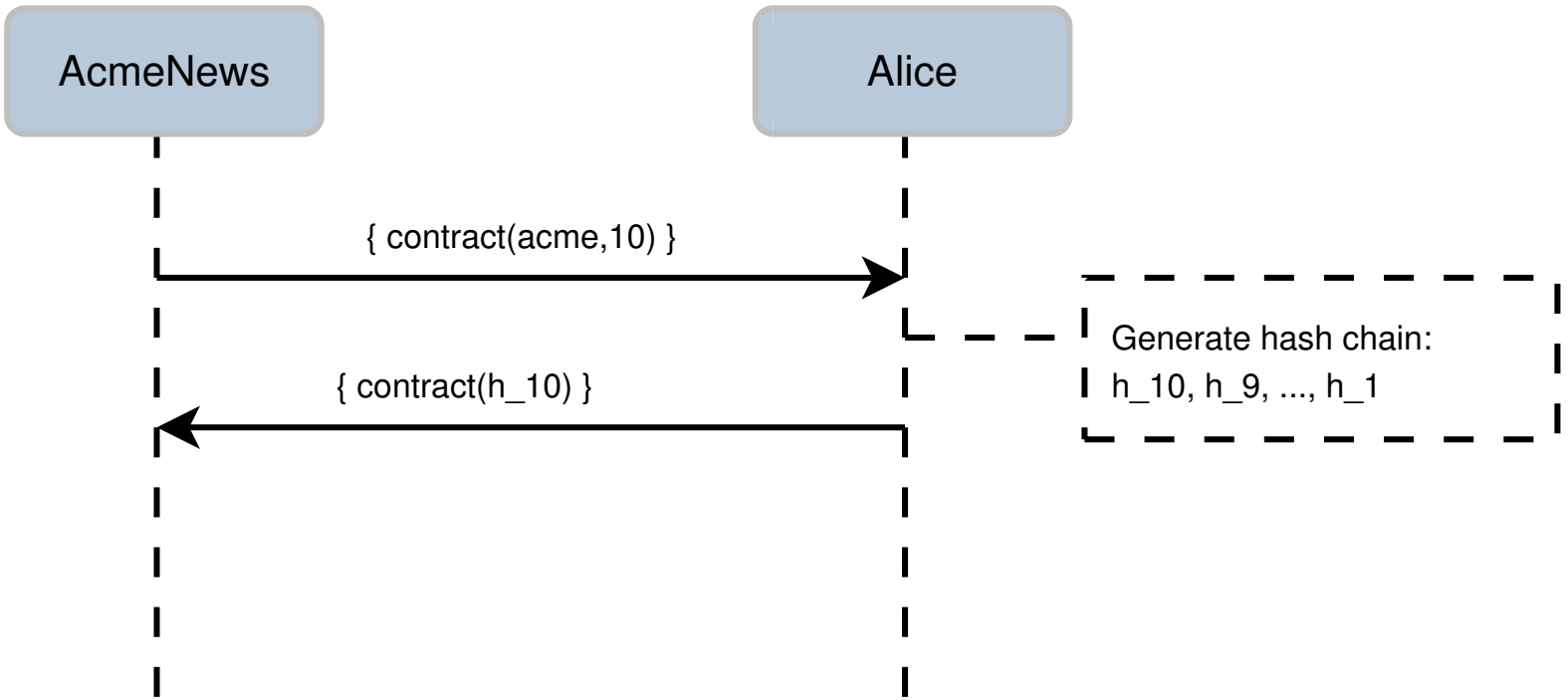

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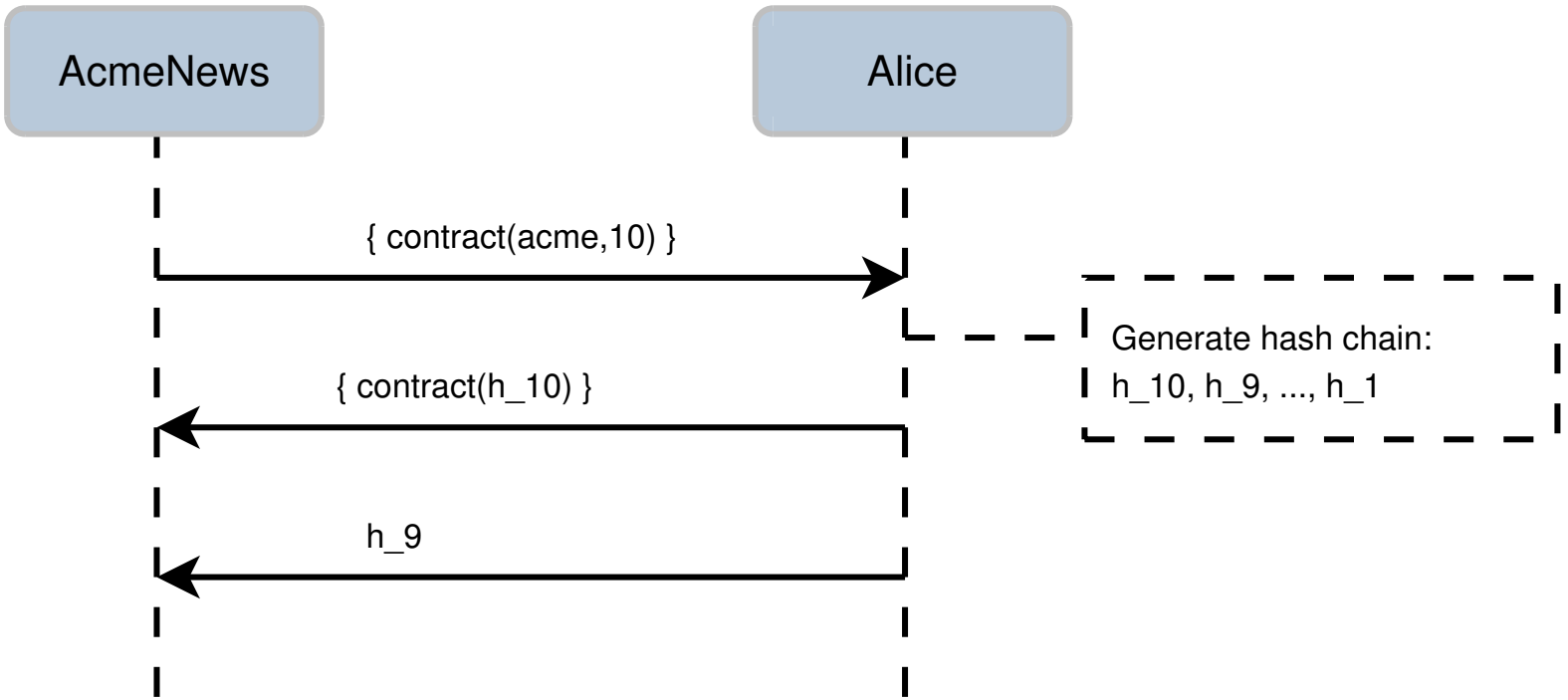

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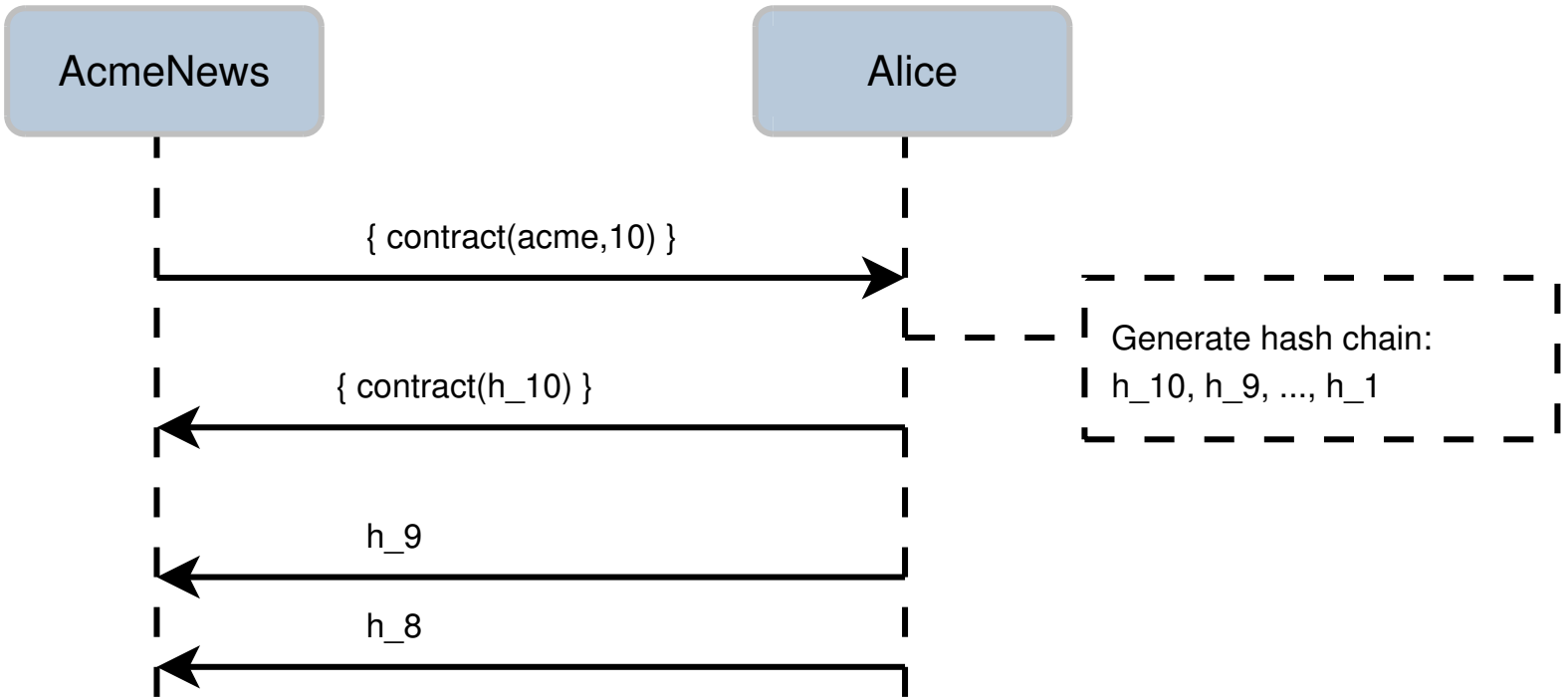
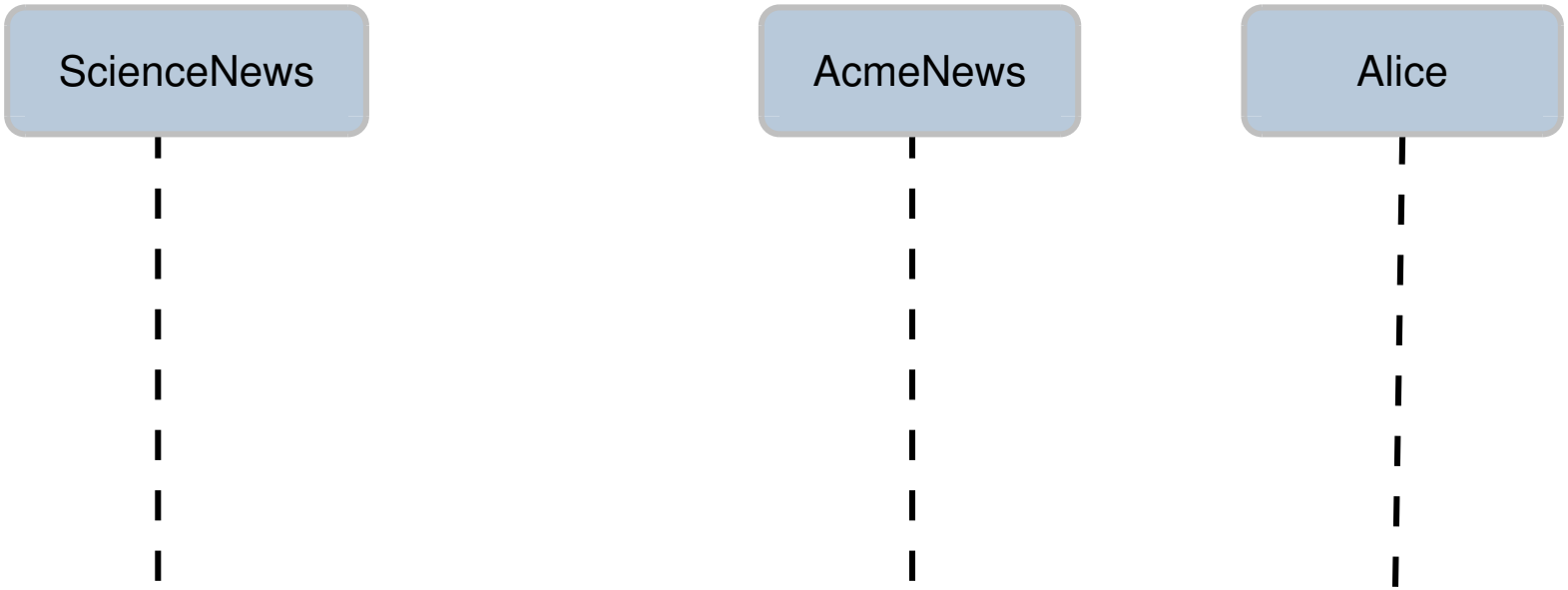


Example: token delegation



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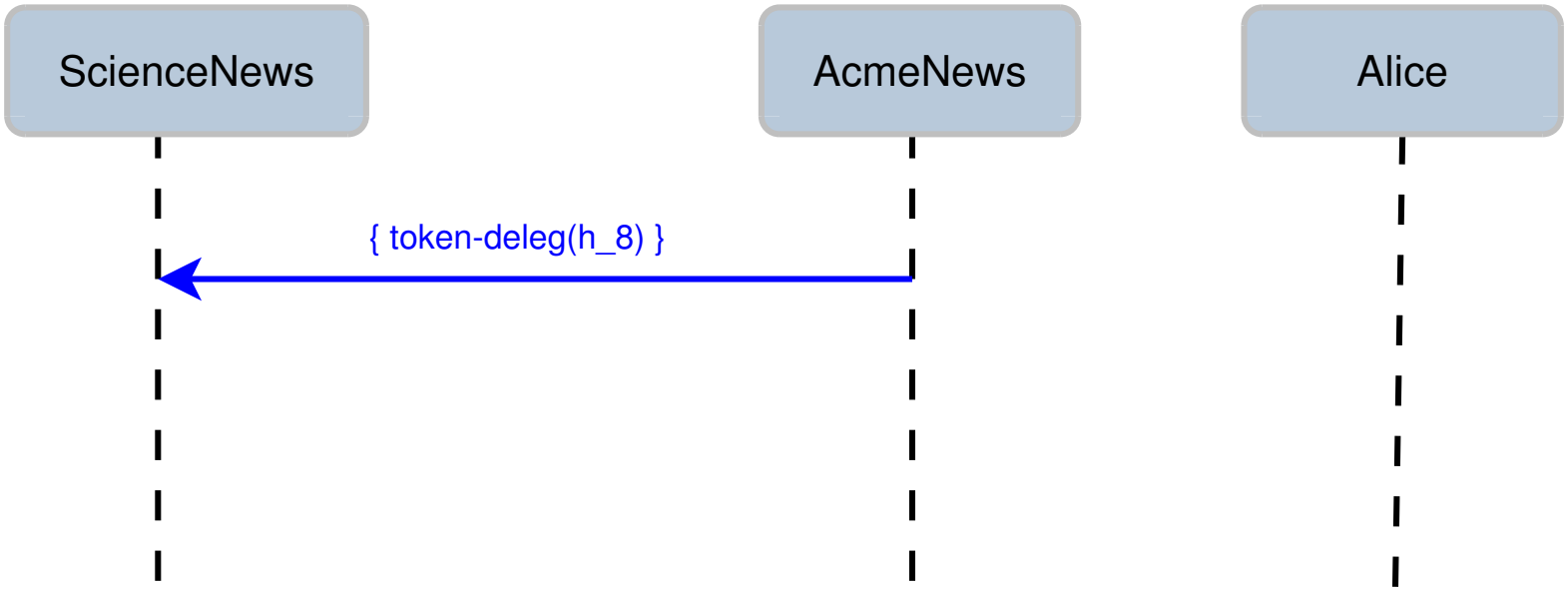

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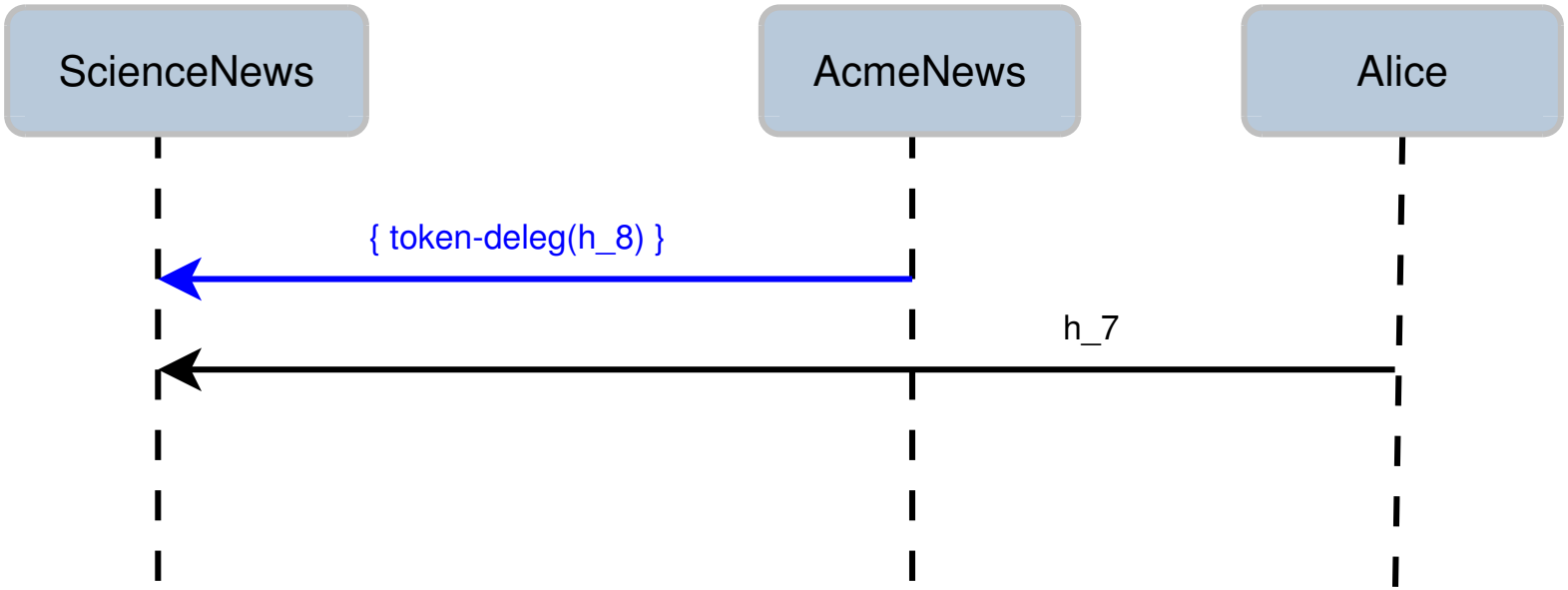

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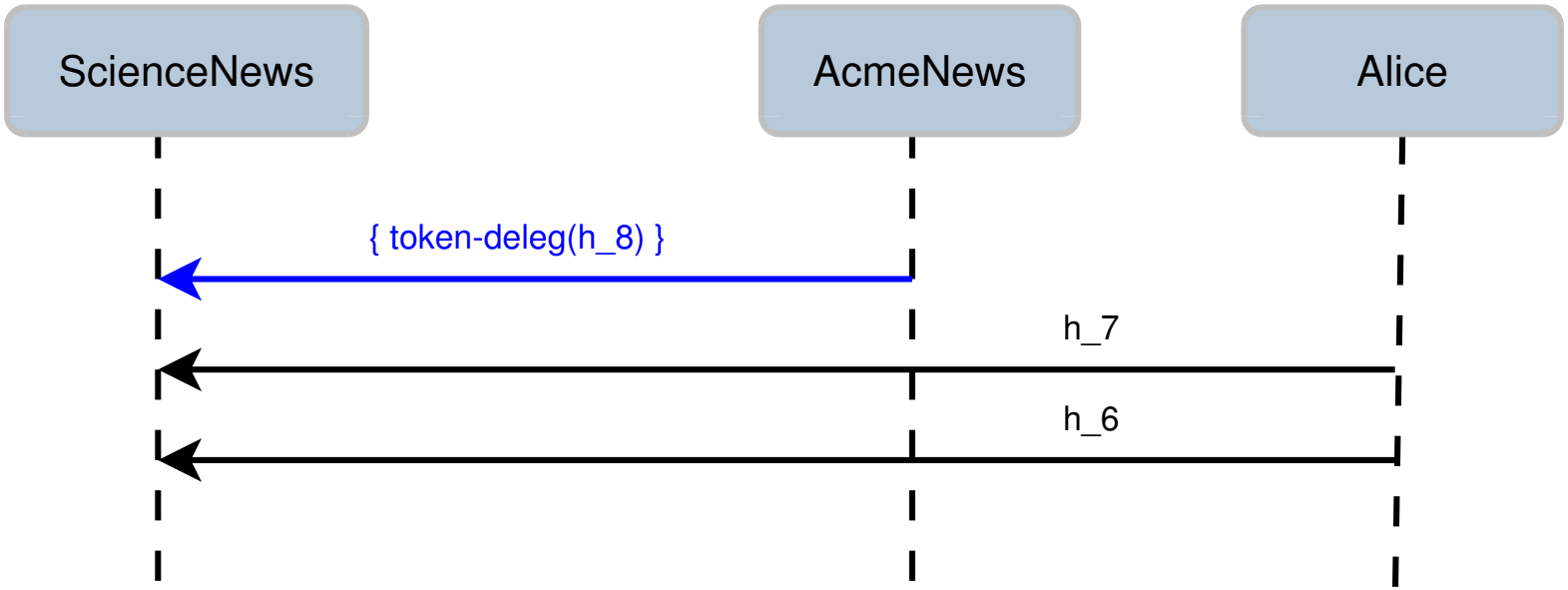

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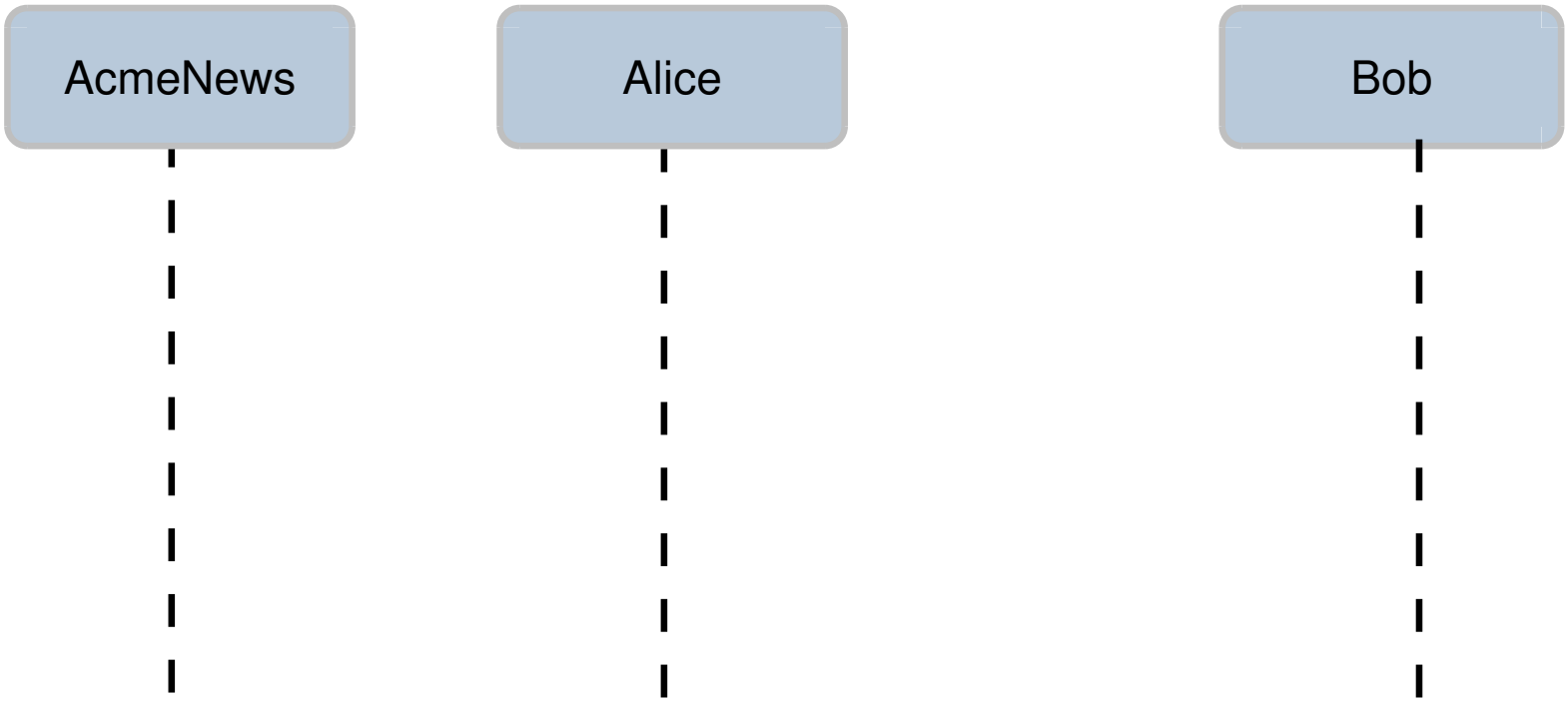

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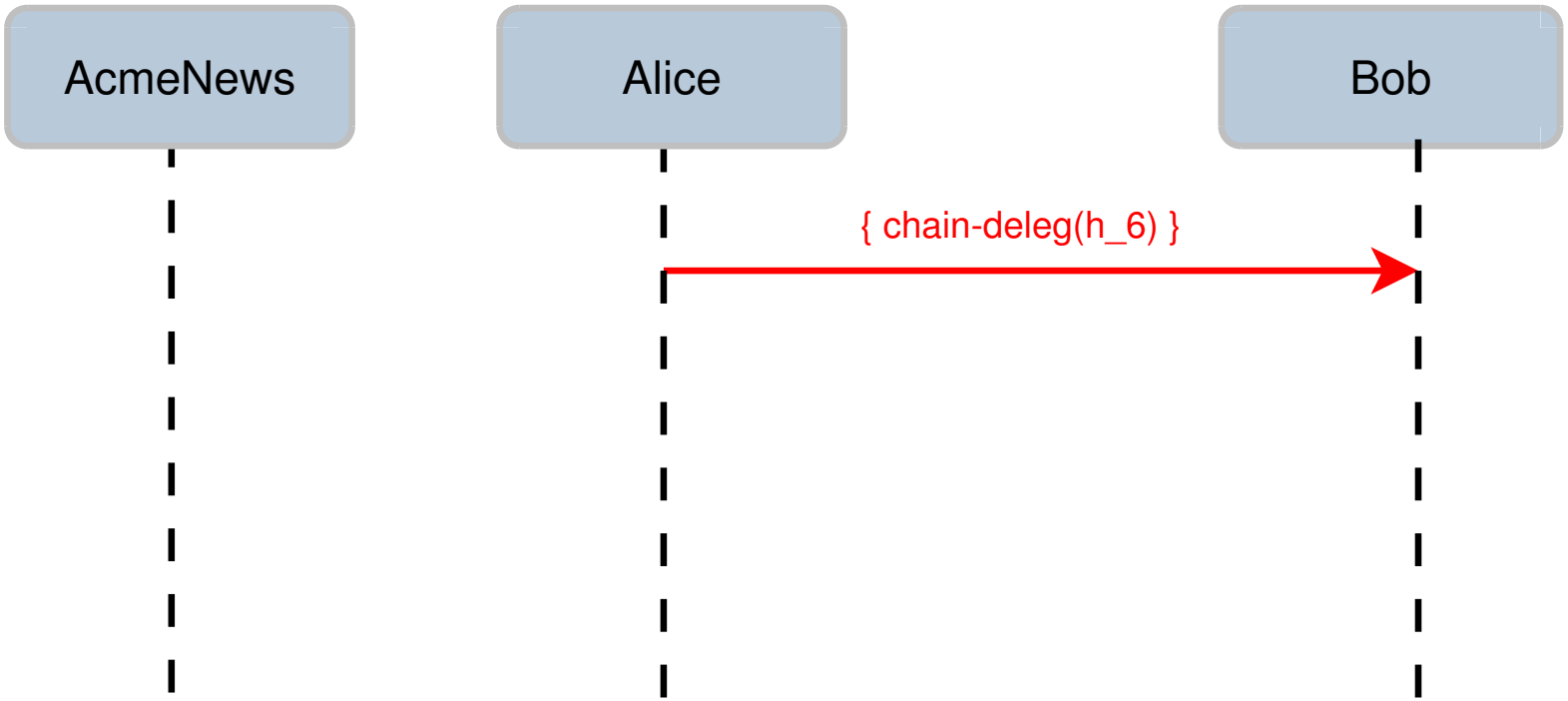

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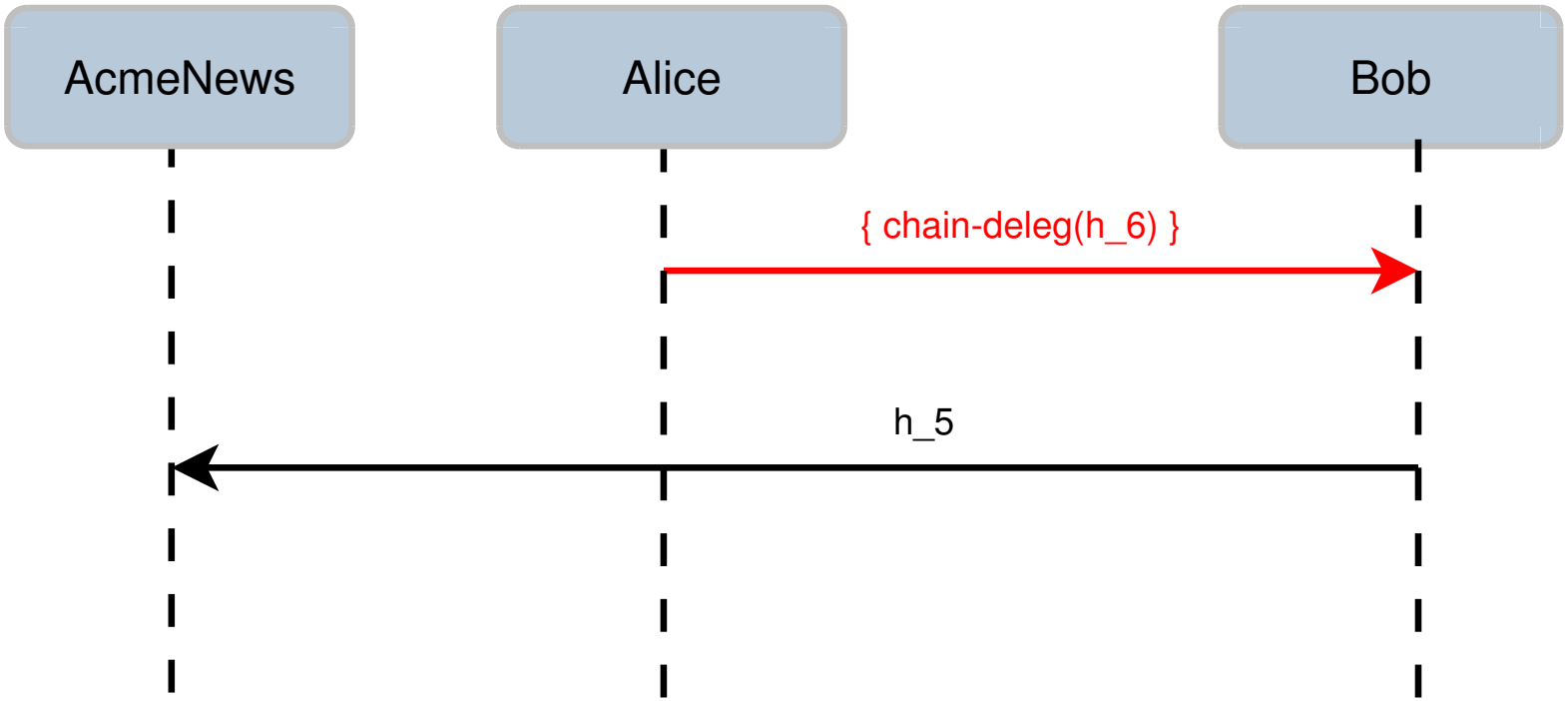

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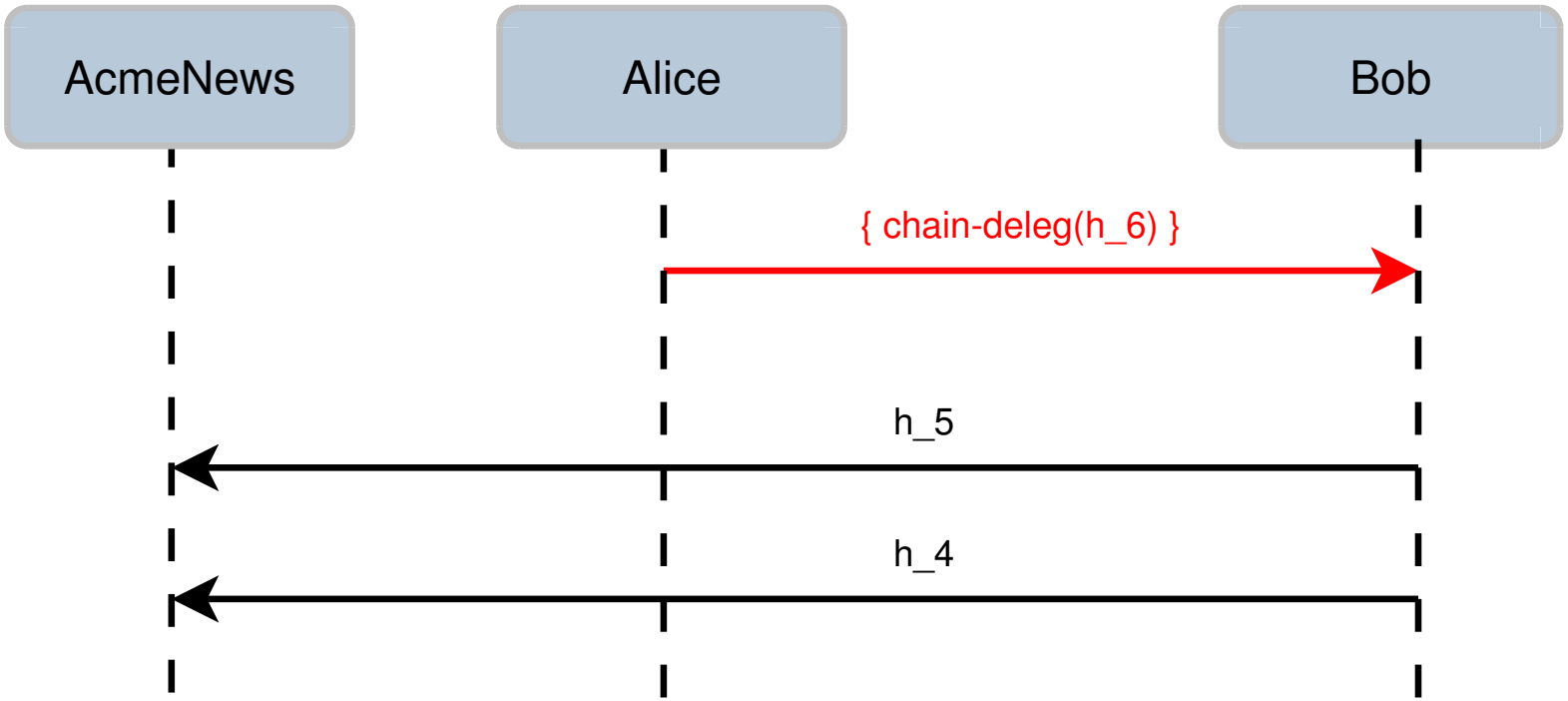

CADAT & Delegation

- token-delegation: delegatee is the consumer of tokens, who offers the service (aka *server-side* delegation).
- chain-delegation: delegatee is the user of the tokens, who access the service (aka *client-side* delegation).

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Implementation

- CADAT is implemented in Java.
- Contracts and delegations encoded as **SPKI/SDSI authorization certificates**.
- Basic functionality provided by **JSDSI**;
  - Chain discovery algorithm $\Longrightarrow$ all computations needed by CATAD.
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Token as SPKI authorization certificate

Partial tag intersection

Authorization token: $p = (cid, i, h^i(m))$

Token-cert without hash verification

```
(cert
  (issuer ...)
  (subject ...)
  (tag
    (h-chain-id |123456789|)
    (h-chain-index (* range numeric ge 7)))
  (comment
    (h-val
      (hash
       md5 |899b786bf7dfad58aa3844f2489aa5bf|))))
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Token-cert with hash verification

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(cert
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  (tag
    (hash-auth
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      (hchain-index 15)
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Applications

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- Micropayment schemes.
- Current application:
  - **Token-based access control for mobile agents**.

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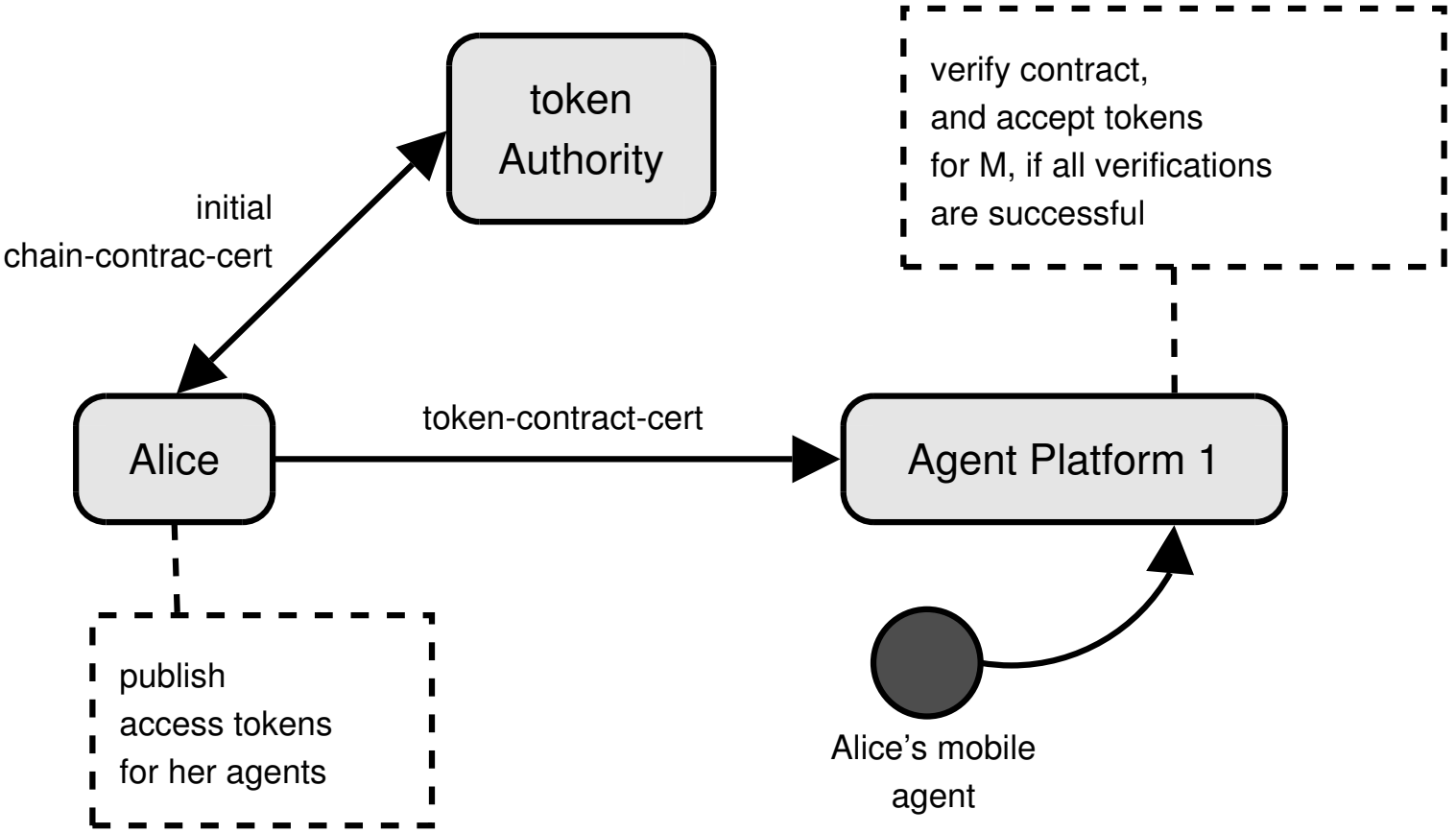
CADAT and mobile agent access control



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Thank you! questions?