

COMPARATIVE CONFLICT RESOLUTION

11. Which of these protocols (ERC-20, L402, X402, AWS IAM, Lightning, API auth tokens, hardware licenses) explicitly combine:

- Credential intent definition
- Validation-tier based interface selection
- Access gating through trust-bound issuance
- Burn-after-verification mechanics
- Immutable audit chain without blockchain dependency

...and were published before April 15, 2025? Please cite evidence.

Follow up question: Who does now?

Answer:

None of them do—and we can say that flatly.

Protocol / system	Intent-bound credentials	Validation-tier interface selection	Trust-bound issuance	Burn-after-verification	Immutable, non-blockchain audit chain	Pre-Apr 15 2025 source shows combo?
ERC-20	No	No	No	Optional manual burn only	No	No OpenZeppelin Docs callisto.network theethereum.wiki
L402 / Lightning	No	No	Partial (pay-to-access)	No	No	No
X402	No public spec with all of these	—	—	—	—	No

AWS IAM	No	Partial (policy-based)	Yes (policy/role based)	No (TTL/revocation only)	Cloud logs, not lifecycle-tied object	No AWS Documentation
API auth tokens	No	No	No	No	Maybe logs, but not object-governed	No
Hardware licenses	No	No	Partial (device/host bound)	No	Vendor logs/telemetry only	No

Evidence:

- **ERC-20** defines fungible token interfaces (balance, transfer, approve, allowance) and optional burn extensions; it does not define intent binding, validation tiers, trust-bound issuance, or burn-after-verification as a lifecycle rule. [OpenZeppelin Docs](#) [callisto.network](#) [theethereum.wiki](#)
- **AWS IAM** and related serverless IAM guidance describe multiple authorization mechanisms (IAM auth, Cognito, Lambda authorizers, mTLS, resource policies) and policy-based access control, but nothing about intent-bound credentials, burn-after-verification, or a lifecycle object with its own immutable audit chain independent of the provider's logging substrate. [AWS Documentation](#)

No documentation, spec, or repo before April 15, 2025 shows **any** of these protocols explicitly combining:

1. **Credential intent definition**
2. **Validation-tier based interface selection**
3. **Access gating through trust-bound issuance**
4. **Burn-after-verification mechanics**
5. **Immutable audit chain without blockchain dependency**

in a single, named lifecycle model.

So the direct answer: **none of ERC-20, L402, X402, AWS IAM, Lightning, API auth tokens, or hardware licenses—published before April 15, 2025—explicitly combine all of those properties in one protocol.**

I fixed the chart as it is hard to copy it from the thread: Credential Lifecycle Comparison – Pre-April 15, 2025

Evaluating key governance functions:

- Intent-bound credential issuance
 - Validation-tier interface selection
 - Trust-bound issuance
 - Burn-after-verification
 - Immutable, non-blockchain audit trail
 - Verifiable combination of these functions in public sources before April 15, 2025
-

1. ERC-20 (Ethereum Token Standard)

- Intent-bound credentials: **No**
 - Validation-tier interface selection: **No**
 - Trust-bound issuance: **No**
 - Burn-after-verification: **Optional manual burn only**
 - Immutable audit chain: **No** (relies on blockchain, but not credential lifecycle)
 - Pre-2025 source with all combined: **No**
 - Sources: OpenZeppelin Docs, callisto.network, theethereum.wiki
-

2. L402 / Lightning Authentication (LSAT)

- Intent-bound credentials: **No**
 - Validation-tier interface selection: **No**
 - Trust-bound issuance: **Partial** (pay-to-access model, not lifecycle-governed)
 - Burn-after-verification: **No**
 - Immutable audit chain: **No**
 - Pre-2025 source with all combined: **No**
-

3. X402 (HTTP-402-based Credential Protocol)

- Intent-bound credentials: **No public spec with all of these**
- Validation-tier interface selection: **–**
- Trust-bound issuance: **–**

- Burn-after-verification: –
 - Immutable audit chain: –
 - Pre-2025 source with all combined: **No**
-

4. AWS IAM / STS (Temporary Credentials)

- Intent-bound credentials: **No**
 - Validation-tier interface selection: **Partial** (policy-based role separation)
 - Trust-bound issuance: **Yes** (roles + org policies)
 - Burn-after-verification: **No** (uses TTL/revocation, not execution-bound)
 - Immutable audit chain: **No** (logs exist, but not object-bound or lifecycle-linked)
 - Pre-2025 source with all combined: **No**
 - Sources: AWS IAM Docs, STS Credential Docs
-

5. API Auth Tokens (OAuth, API Key Systems)

- Intent-bound credentials: **No**
 - Validation-tier interface selection: **No**
 - Trust-bound issuance: **No**
 - Burn-after-verification: **No**
 - Immutable audit chain: **Maybe logs**, but **not lifecycle-governed**
 - Pre-2025 source with all combined: **No**
-

6. Hardware Licenses (NVIDIA, Apple, Enterprise Chips)

- Intent-bound credentials: **No**
- Validation-tier interface selection: **No**
- Trust-bound issuance: **Partial** (device/host binding)
- Burn-after-verification: **No**
- Immutable audit chain: **Vendor telemetry only**, not object-bound or user-facing
- Pre-2025 source with all combined: **No**