



Blockchain Smart Contracts for Policy Compliance : A Healthcare Perspective



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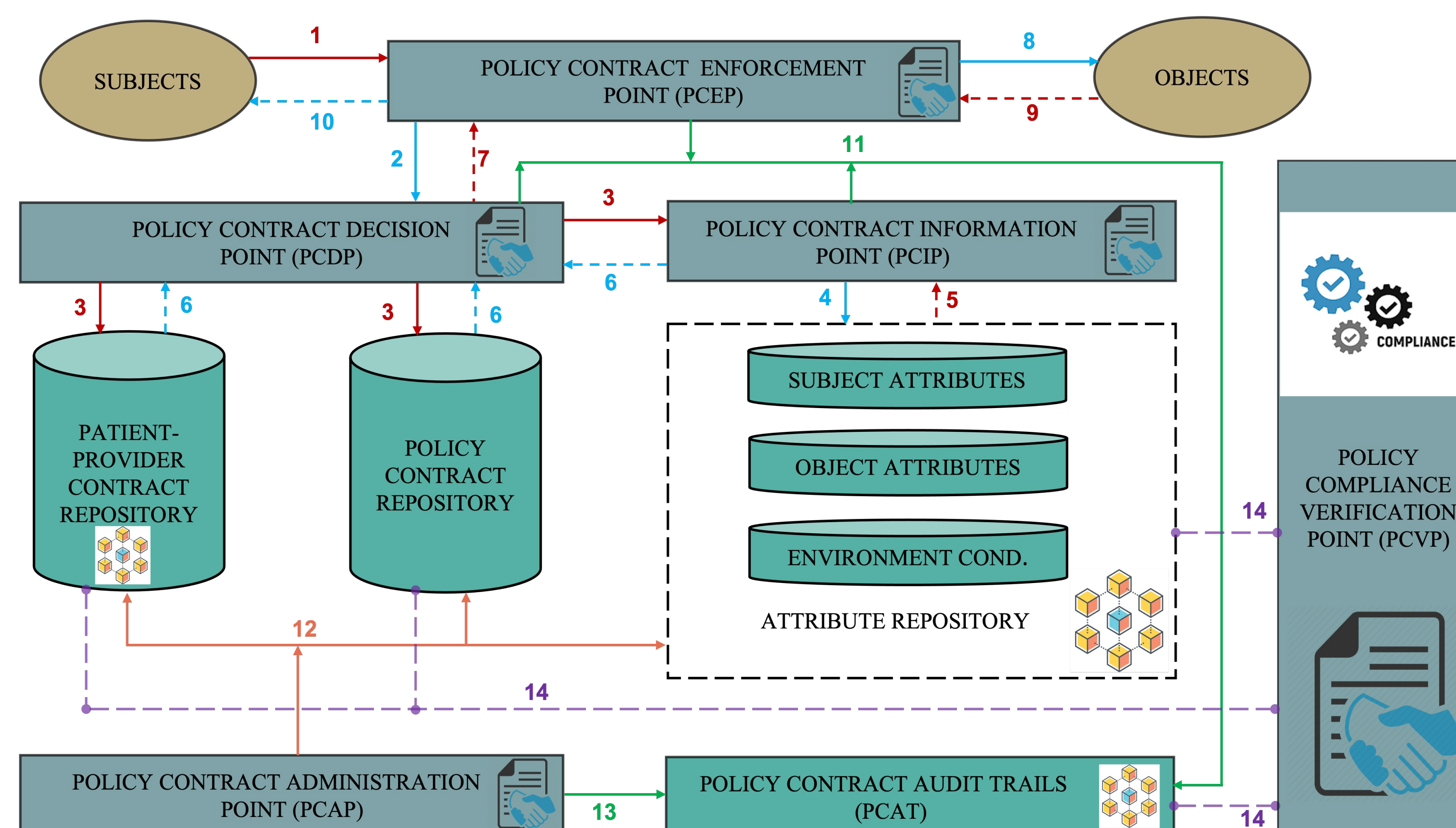
Problem Statement

- For stronger security guarantees, demonstrating / proving policy compliance is must
- Policy compliance is challenging since policies can range from national level policies to state-level, city-level, organization-level policies, and also individual user level
- Problems in policy specification and implementation remain unidentified until a breach
- Organizational subcultures often lead to policy violations

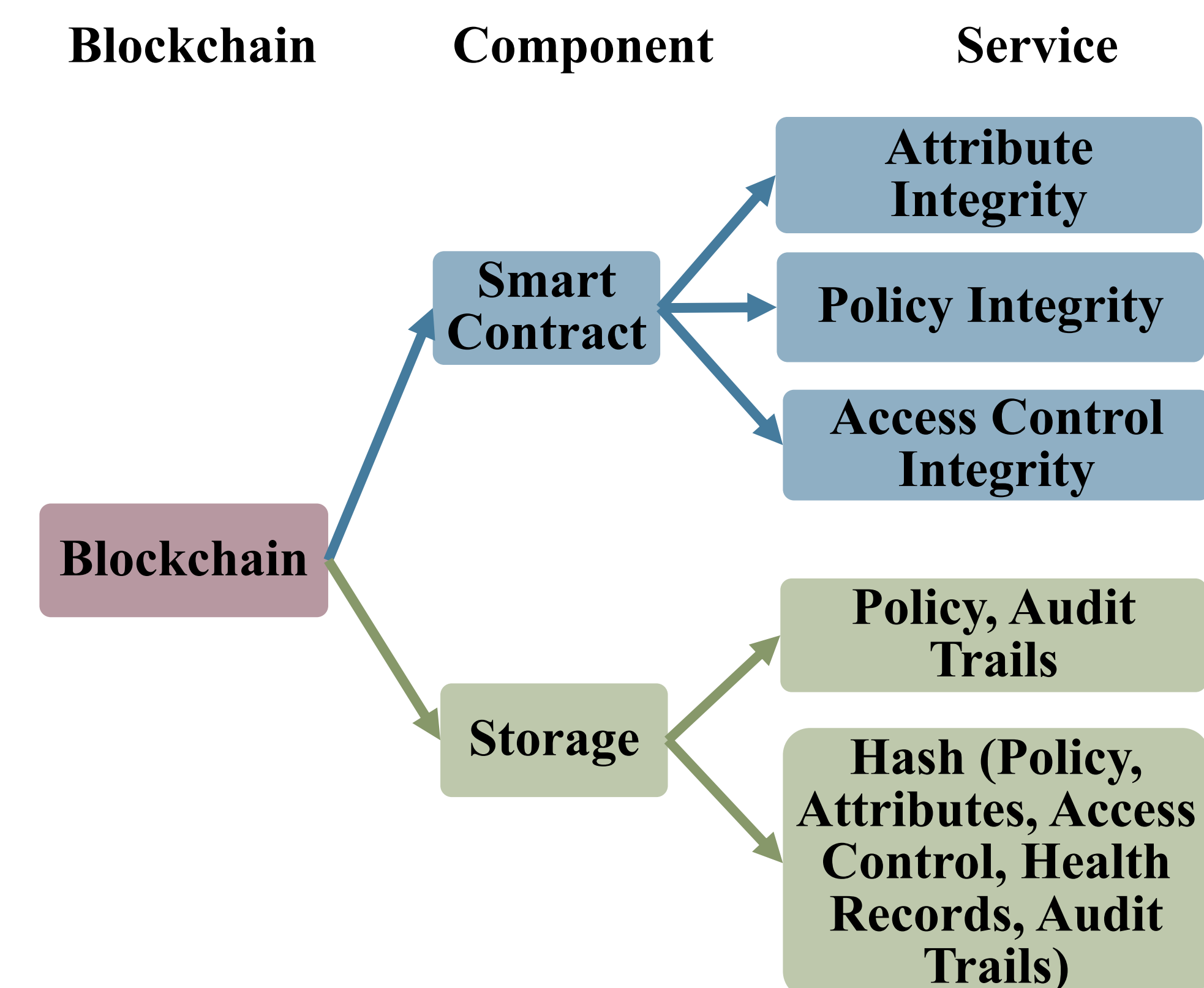
Proposed Approach

- A blockchain's decentralized consensus mechanism and immutable, integrity verified storage helps provenance by maintaining better audit trail
- Implementing policies as smart contracts ensures compliance via auto triggering and consensus mechanism doubles as strong reference monitor
- Proof of Compliance (PoC) blockchain consensus mechanism to verify compliance and non-compliance actions

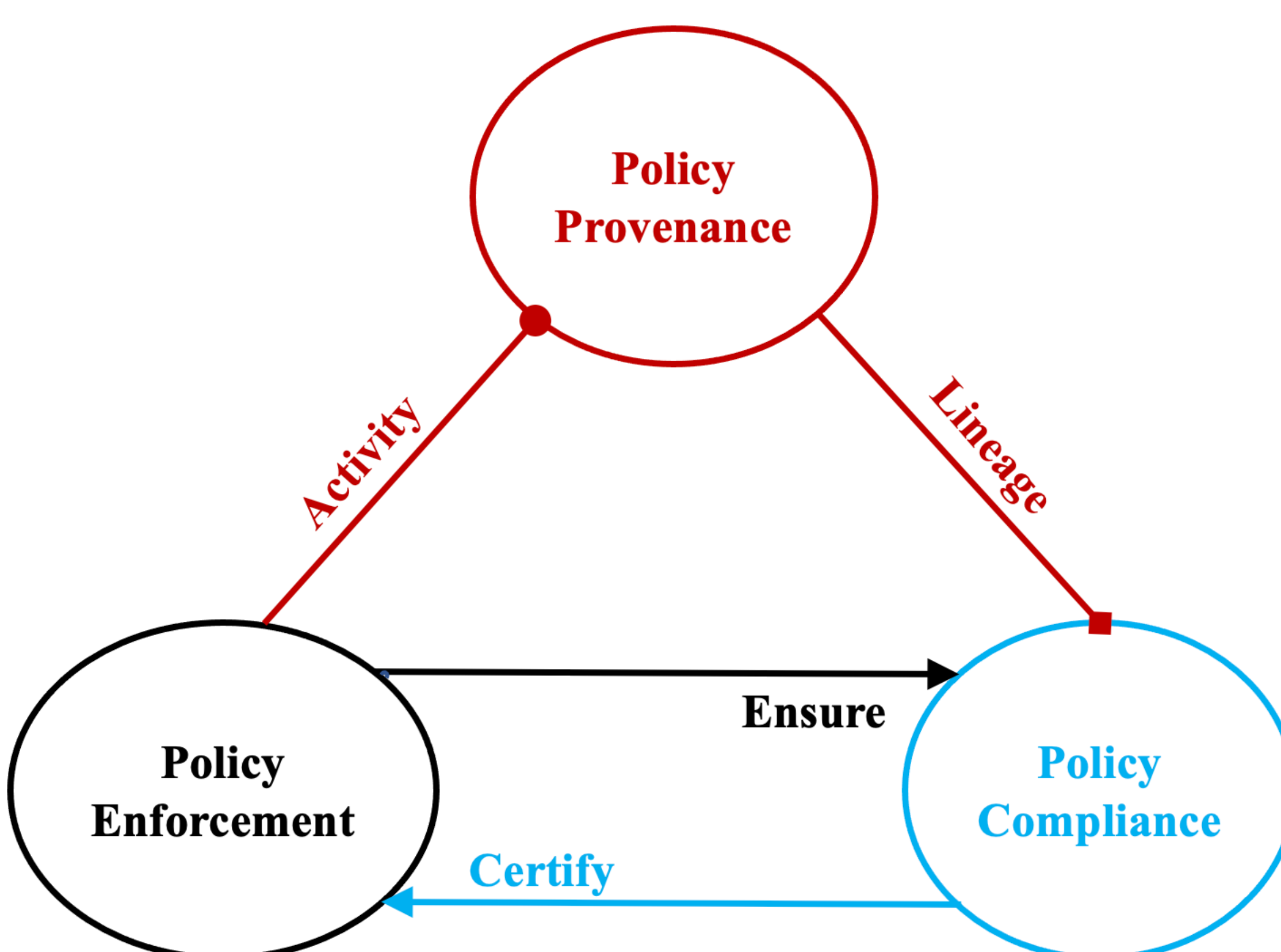
Contract Based Policy Enforcement



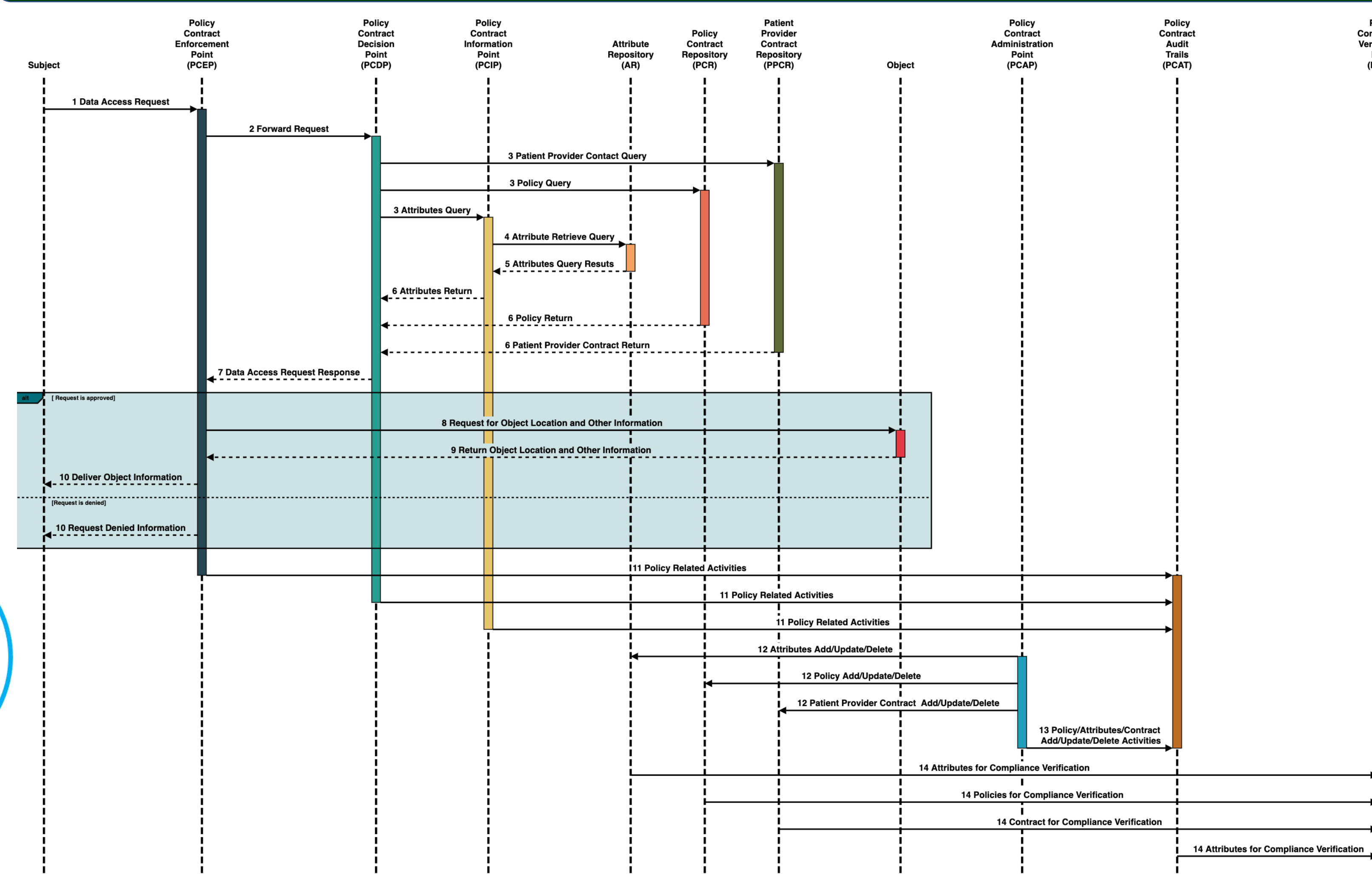
Provenance via Blockchain



Healthcare Policy Compliance



Policy Compliance Sequence Diagram



Future Directions

- Implementing prototype of the proposed model
- Providing verification process of deployed policies and attributes
- Integrating blockchain API with access control model to interact with blockchain network
- Developing mechanism for audit trails verification for a certain user to confirm policy compliance
- Building query API for performing different queries regarding policy compliance for a user/policy/an object

References

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