Privacy Preserving Biometric Authentication

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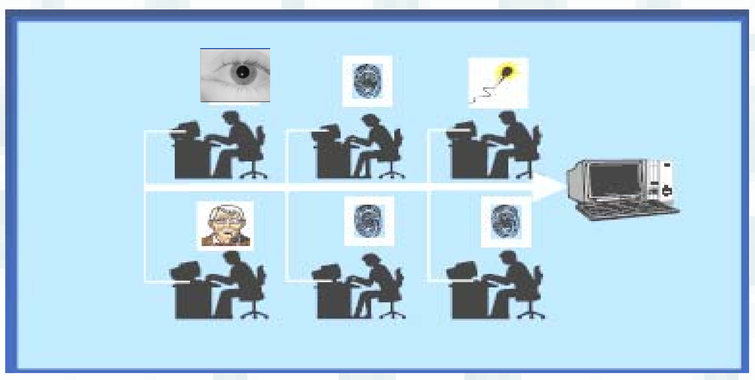
Introduction:

• One approach to the problem of reducing the threat of identity theft is the widespread adoption of systems using biometrics authentication.
• Improper storage and use of identification credentials raises several security and privacy risks.
• **The goal** is to *provide a privacy preserving methodology* for strong biometric authentication in federated identity management systems.

Advantages:

• **Privacy Preserving Multifactor Authentication** [1]: multifactor authentication is essential for secure authentication mechanisms. The identity management framework is used to provide proofs of multiple strong identifiers for a given user.

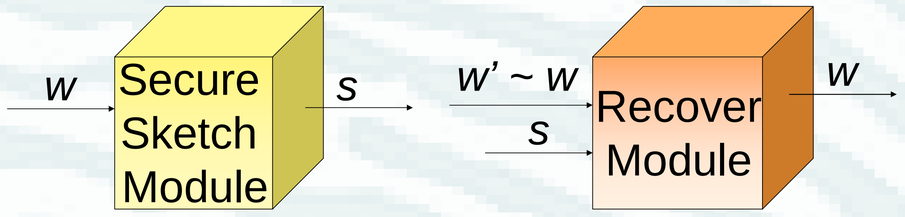
• **Interoperability**: Our scheme provides an interoperable, usable, secure, and inexpensive to use biometric authentication in a federation.



•**User Control** : The raw biometric never leaves the client machine therefore providing complete control to its owner.

Primary Tools Used:

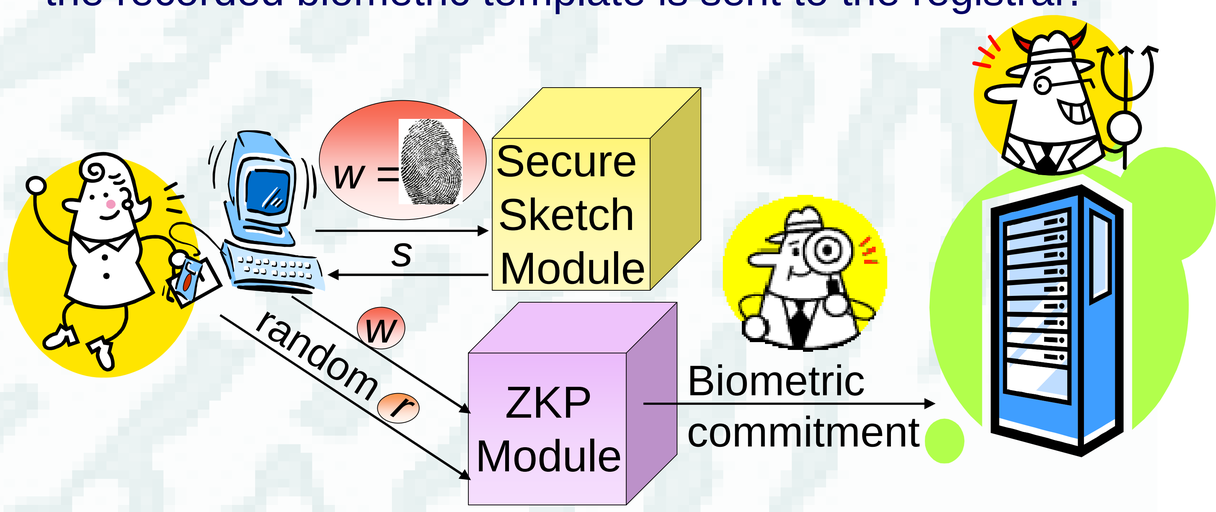
•**Secure Sketches:** Fuzzy key storage mechanism which allows to recover a secret key *w* from a faulty reading *w'* of w.



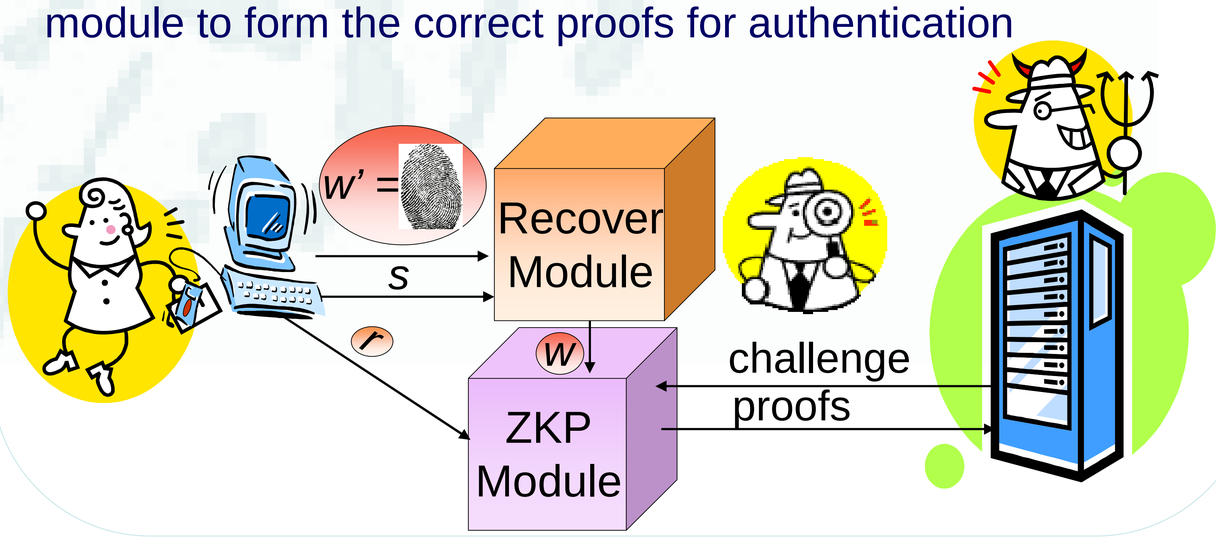
• **Zero Knowledge Proof:** Interactive method allowing one party to prove to another that a statement is true, without revealing anything other than the veracity of the statement.

Authentication Phases:

• **Registration:** The integer commitment corresponding to the recorded biometric template is sent to the registrar.



• **Authentication:** The recover module reproduces the originally stored biometric template which is used by the ZKP module to form the correct proofs for authentication



Reference:
[1] A. B. Spantzel, A. C. Squicciarini, E. Bertino. ***Establishing and Protecting Digital Identity in Federation System***. In proceedings of ACM CCS workshop on Digital Identity Management .

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