

DIMA PROJECT OFFICIAL DOCUMENTATION

"Watchdog"

800471

Claudio Rizzo Emanuele Uliana 799256

4/7/2014

Teacher: Prof. Luciano Baresi

Version 1.0

Indice

| 1 | Context | | |
|---|--|--|--|
| 2 | Purpose Time schedule | | |
| 3 | | | |
| 4 | Actors | 6 | |
| 5 | Functional requirements 5.1 Mobile phones association | 6 6 6 6 6 | |
| 6 | Non-functional requirements 6.1 Privacy and security: problems and solutions 6.1.1 Sender authentication 6.1.2 Message integrity/authentication/non forgeability 6.1.3 Message confidentiality 6.1.4 Asymmetric keys management 6.1.5 Symmetric key management 6.1.6 Public keys mutual authentication 6.1.7 Final recap 6.2 Human friendly interface and transparency 6.3 Performance | 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | |
| 7 | Use cases 7.1 Initialization wizard | 6 7 7 7 7 | |
| 8 | Application Architecture | 8 | |
| 9 | Design Patterns | 8 | |

| 10 | Cryp | oto protocols and alogrithms | 8 |
|-----------|-------|---|----------------------|
| | 10.1 | Elliptic Curves key pair generation | 8 |
| | 10.2 | Socialist Millionaire Protocol | 8 |
| | | 10.2.1 Public key request | 8 8 |
| | | 10.2.2 Public key sending | 8 |
| | | 10.2.3 Question sending | 8 8 |
| | | 10.2.4 Hash sending | |
| | | 10.2.5 Ack and password salt sending | 8 8 |
| | | 10.2.6 Second half | |
| | | 10.2.7 Error management | 8 |
| | 10.3 | Elliptic Curves Diffie Hellman key exchange | 8 8 8 8 |
| | 10.4 | Command Protocol | 8 |
| | | 10.4.1 First message | 8 |
| | | 10.4.2 Second message | 8 |
| | | 10.4.3 Third message | 8 8 |
| | | 10.4.4 Fourth message | |
| | | 10.4.5 Error management | 8 8 |
| | | 10.4.6 Timeout management | |
| | 10.5 | Elliptic Curves Digital Signature Algorithm | 8 |
| | 10.6 | AES256GCM | 9 |
| 11 | Cryp | oto testing | 10 |
| | | | |
| 12 | Prot | tocol testing | 10 |
| 13 | Insta | allation | 11 |
| 14 | 14.2 | Initialization wizard | 11 11 11 11 |

Chapter A: Project context and purpose

- 1 Context
- 2 Purpose

Chapter B: Project planning

3 Time schedule

Chapter C: Requirements analysis

- 4 Actors
- 5 Functional requirements
- 5.1 Mobile phones association
- 5.2 Mobile phone remote localization
- 5.3 Mobile phone remote mark
- 5.4 Mobile phone remote alarm triggering
- 6 Non-functional requirements
- 6.1 Privacy and security: problems and solutions
- 6.1.1 Sender authentication
- 6.1.2 Message integrity/authentication/non forgeability
- 6.1.3 Message confidentiality
- 6.1.4 Asymmetric keys management
- 6.1.5 Symmetric key management
- 6.1.6 Public keys mutual authentication
- 6.1.7 Final recap
- **6.2** Human friendly interface and transparency
- 6.3 Performance
- 7 Use cases

- 7.1 Initialization wizard
- 7.2 Mobile phones association
- 7.3 Remote control: localization
- 7.4 Remote control: mark stolen/lost/both/found
- 7.5 Remote control: alarm triggering/untriggering

Chapter D: Design

- 8 Application Architecture
- 9 Design Patterns
- 10 Crypto protocols and alogrithms
- 10.1 Elliptic Curves key pair generation
- 10.2 Socialist Millionaire Protocol
- 10.2.1 Public key request
- 10.2.2 Public key sending
- 10.2.3 Question sending
- 10.2.4 Hash sending
- 10.2.5 Ack and password salt sending
- 10.2.6 Second half
- 10.2.7 Error management
- 10.3 Elliptic Curves Diffie Hellman key exchange
- 10.4 Command Protocol
- 10.4.1 First message
- 10.4.2 Second message
- 10.4.3 Third message
- 10.4.4 Fourth message
- 10.4.5 Error management
- 10.4.6 Timeout management
- 10.5 Elliptic Curves Digital Signature Algorithm

10.6 AES256GCM

Chapter E: Testing

- 11 Crypto testing
- 12 Protocol testing

Chapter F: Installation and usage manual

- 13 Installation
- 14 Usage
- 14.1 Initialization wizard
- 14.2 Change application settings
- 14.3 Send a command message