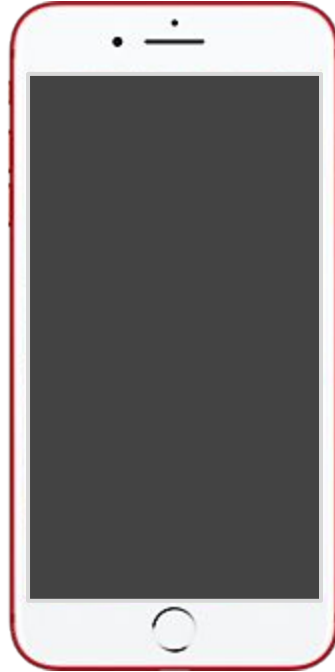# The Wearable Identity System

A Detailed Look

◆ Objectives ◆

1. Look in more detail at the patented Wearable Identity System.
2. Walk through some typical scenarios that the system enables.
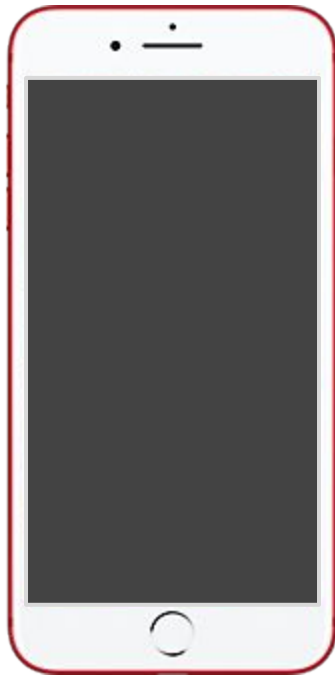3. Better understand what is going on "under the hood".

The "Actors"

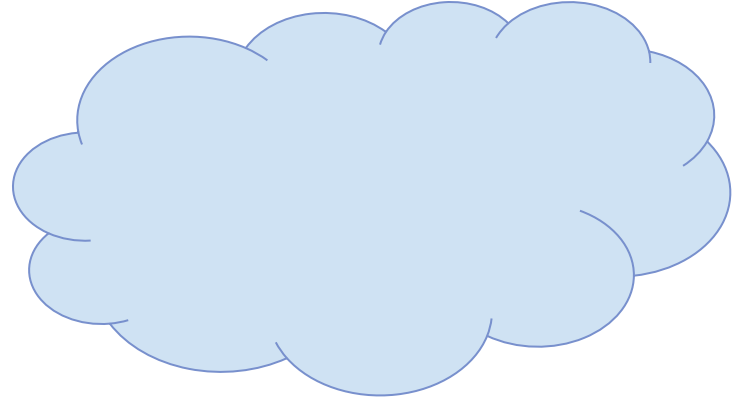- a mobile device
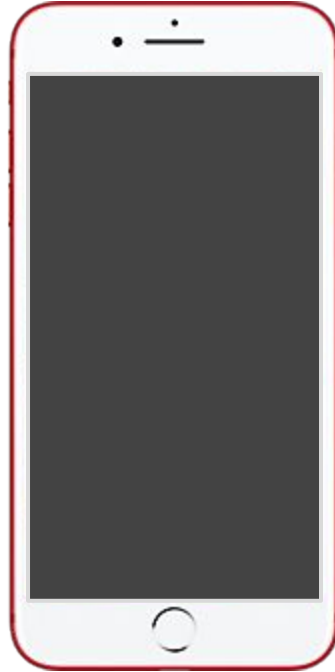
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The "Actors"

- a mobile device

- a wearable device

The "Actors"

- a mobile device
- a wearable device
- the cloud

◆ A Play in Four Acts ◆
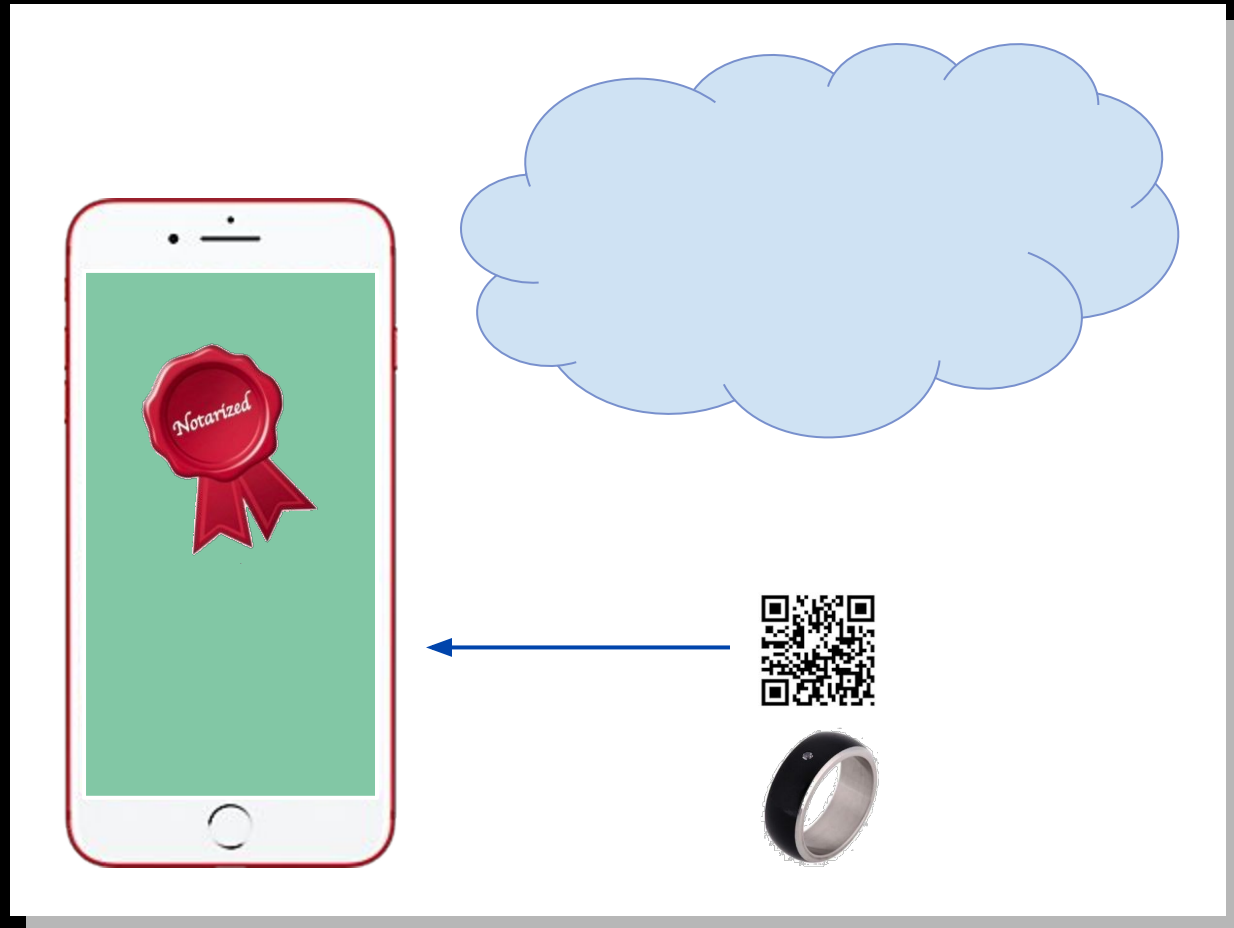
Let's walk through what is happening on these devices for the following scenarios…

- pairing the mobile and wearable devices
- unlocking the mobile device
- notarizing a financial transaction
- refreshing the notary key

Pairing the Devices

1. Scan the wearable's QR code

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Pairing the Devices

1. Scan the wearable's QR code

2. Generate a private notary key
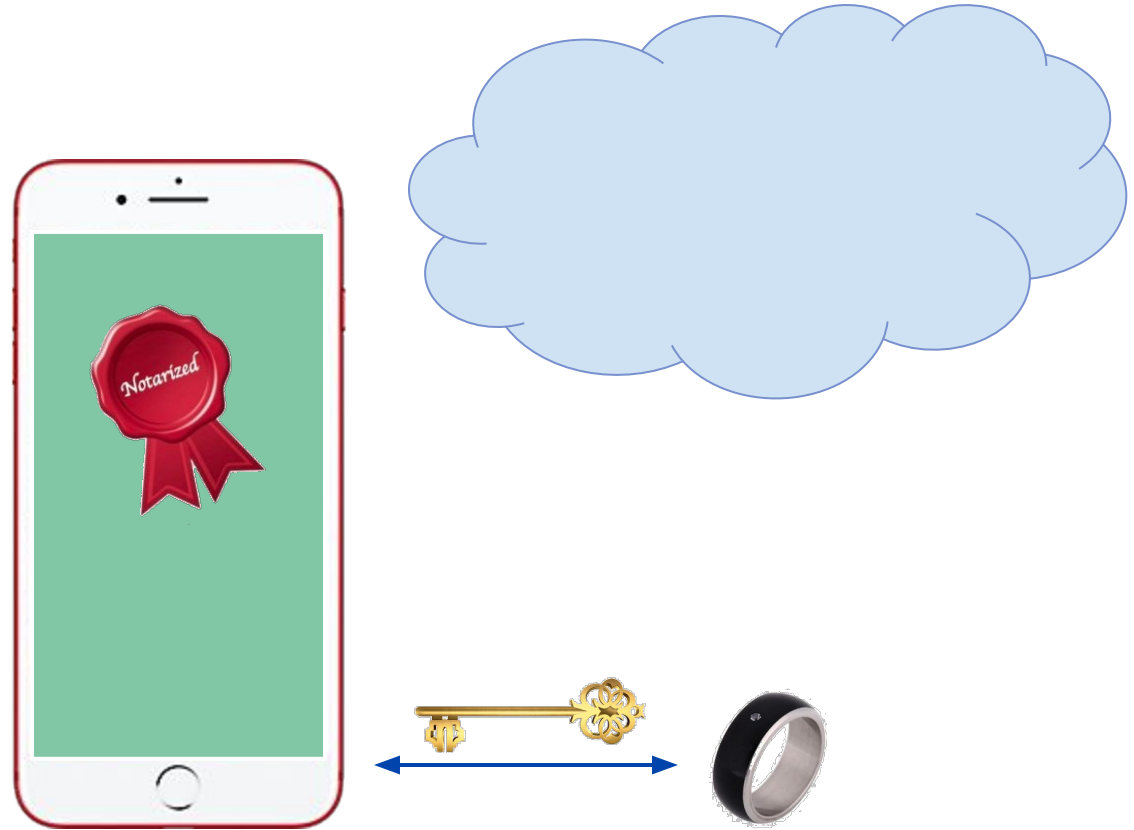
Pairing the Devices

1. Scan the wearable's QR code

2. Generate a private notary key

3. Publish the corresponding public certificate
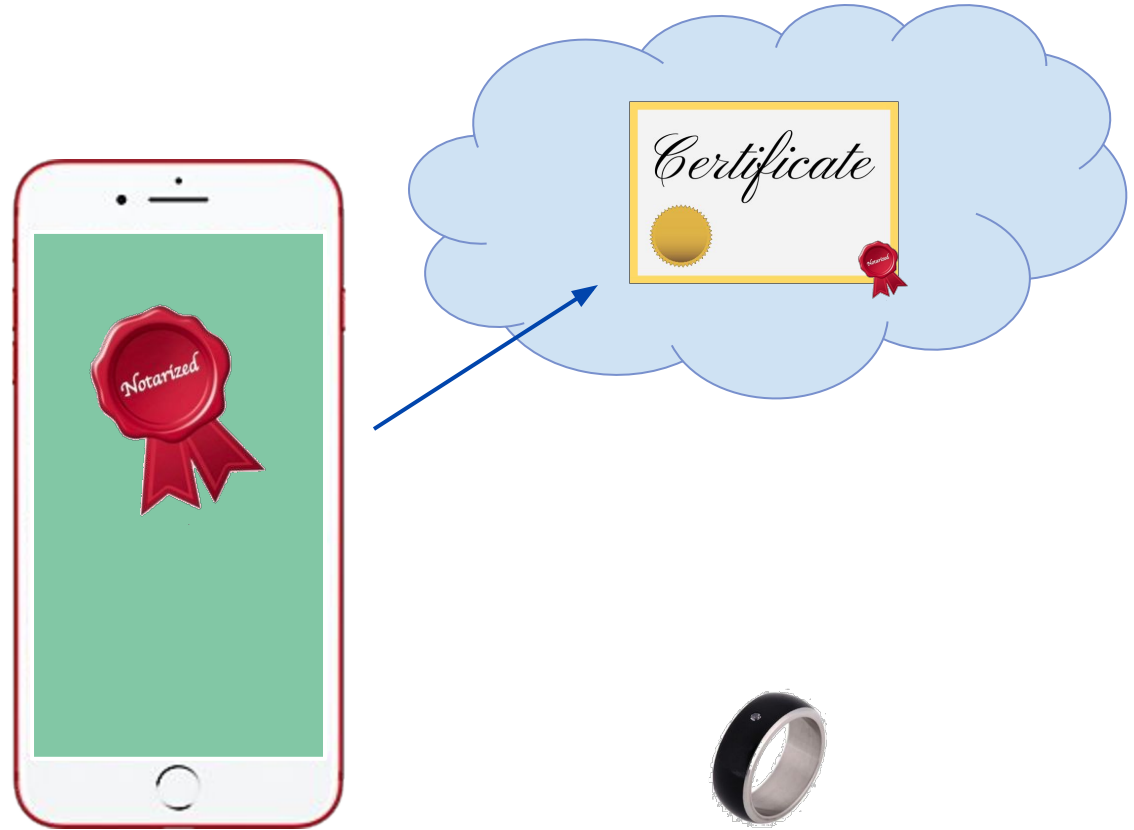
Unlocking a Device

1. Notarize a login request

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Unlocking a Device

1. Notarize a login request
2. Validate the notary seal

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Unlocking a Device

1. Notarize a login request
2. Validate the notary seal
3. Unlock the mobile device

Financial Transaction
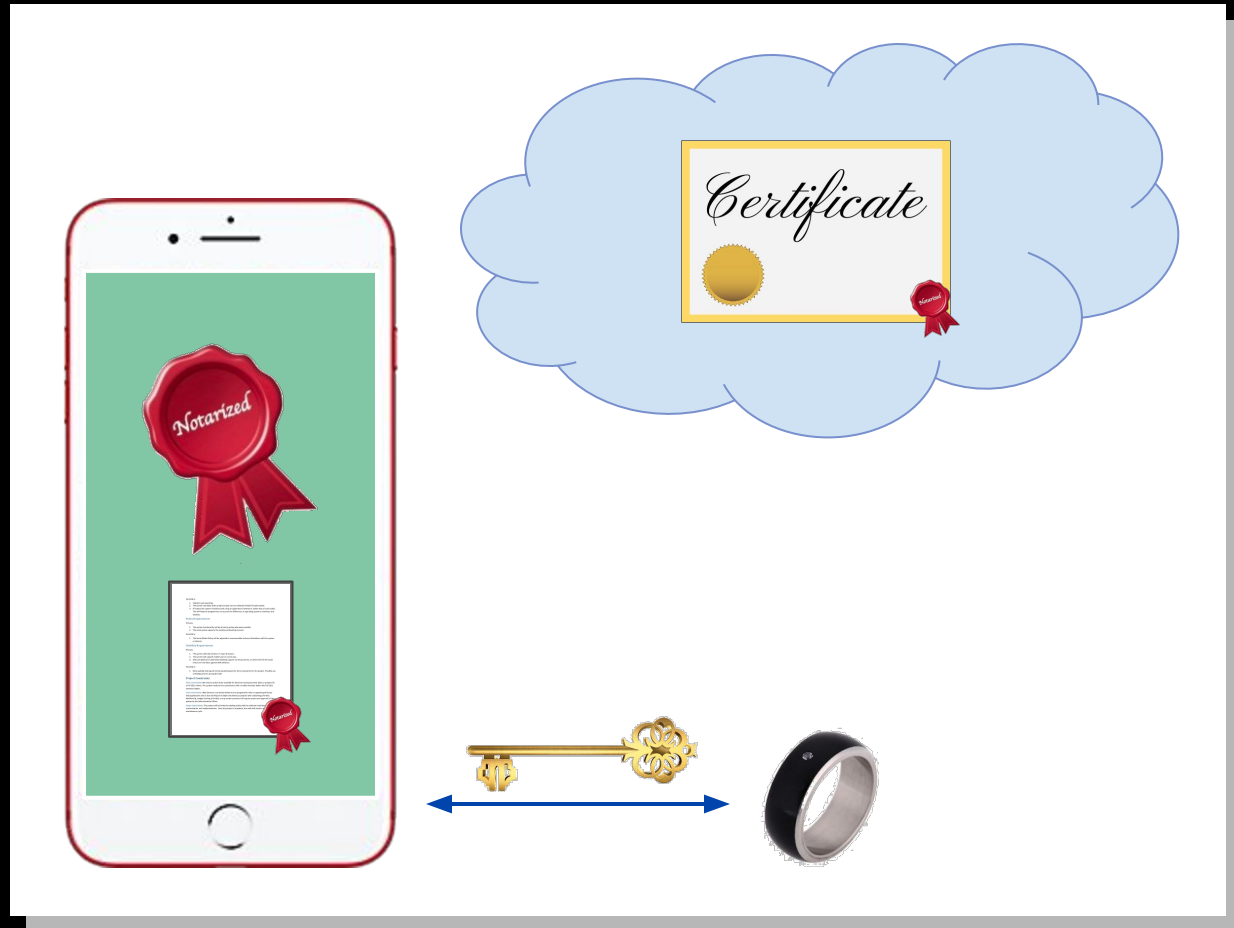
1. Notarize a financial transaction

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Financial Transaction

1. Notarize a financial transaction

2. **Send the transaction to the bank**

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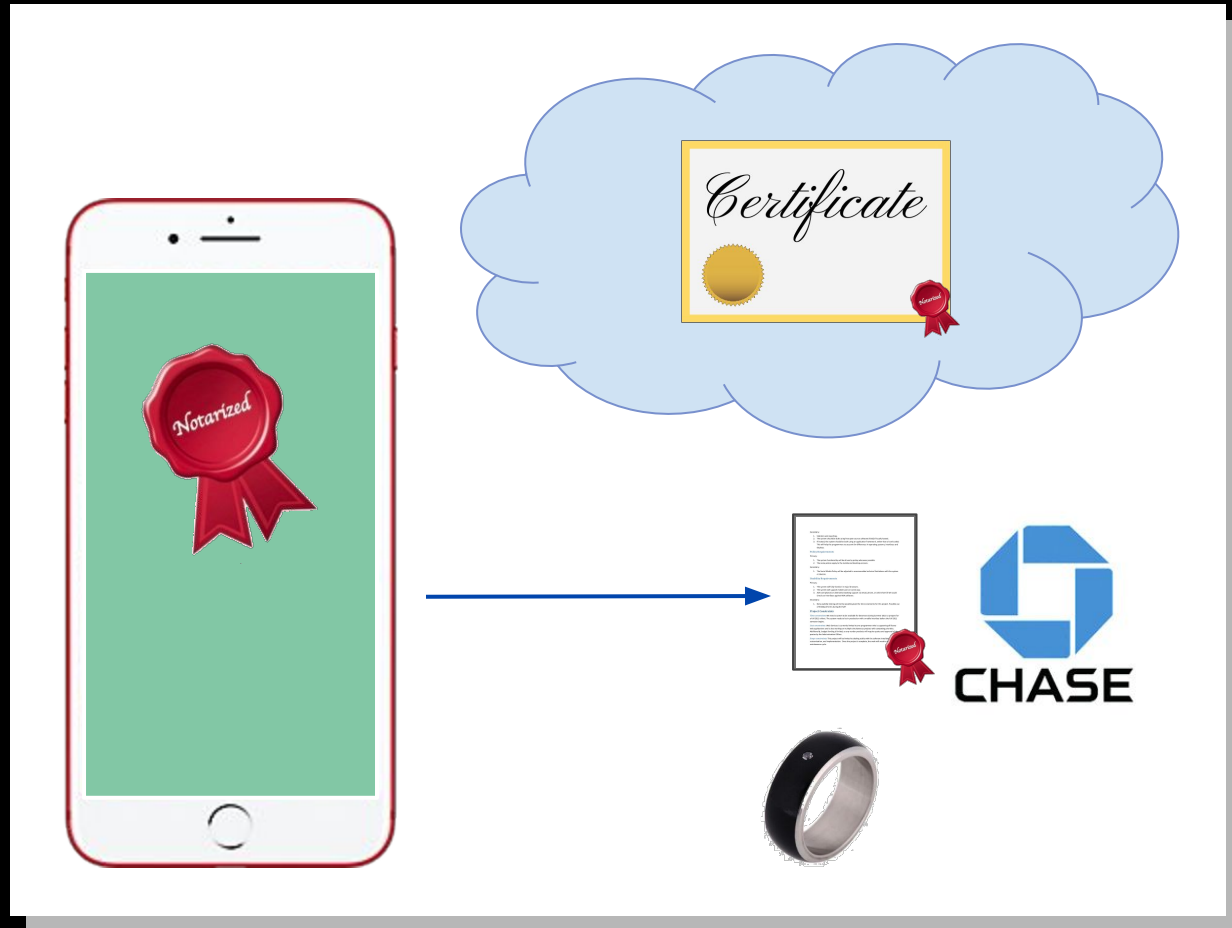
Financial Transaction

1. Notarize a financial transaction

2. Send the transaction to the bank

3. Validate the notary seal
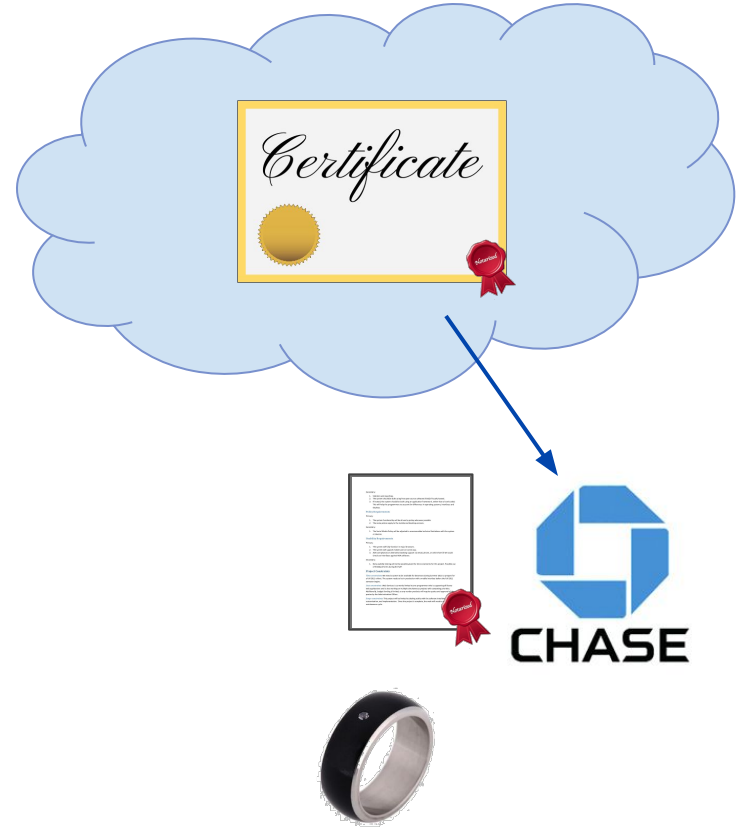
Financial Transaction

1. Notarize a financial transaction

2. Send the transaction to the bank

3. Validate the notary seal

4. Approve the transaction

Refresh Notary Key

1. Generate a new private notary key
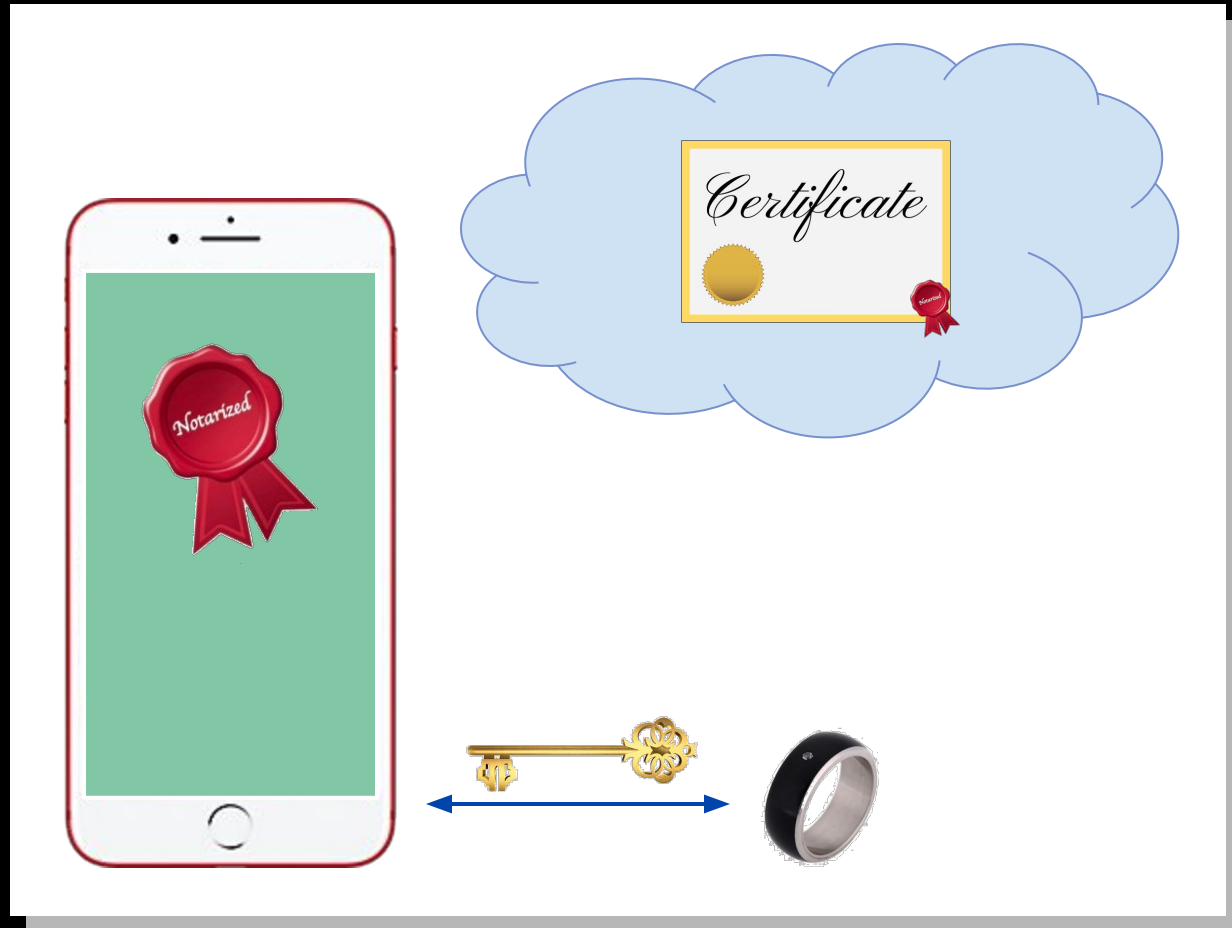
Refresh Notary Key

1. Generate a new private notary key

2. Publish the new public certificate

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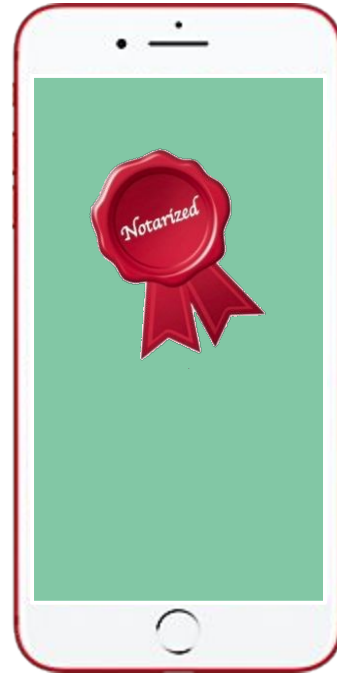
The "Secret Sauce"

- US Patent 9,853,813

How does the notarization work?
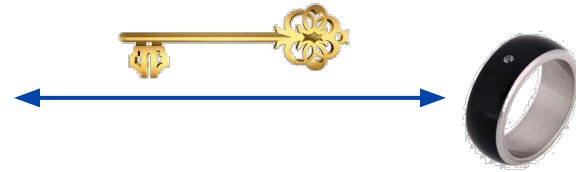
The "Secret Sauce"

- mobile key

Generate a random mobile key.

mobile key

0	0	1	0	...	1	0

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The "Secret Sauce"

- mobile key

Pass the key to the wearable.

mobile key

0	0	1	0	...	1	0

mobile key

0	0	1	0	...	1	0

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The "Secret Sauce"

- mobile key
- notary key

Generate a private notary key.

mobile key

0	0	1	0	...	1	0

notary key

1	0	0	1	...	1	1

mobile key

0	0	1	0	...	1	0

The "Secret Sauce"

- mobile key
- notary key
- **wearable key**

Derive the wearable key.

0	0	1	0	...	1	0

XOR

1	0	0	1	...	1	1

⇩

1	0	1	1	...	0	1

wearable key

mobile key

0	0	1	0	...	1	0

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The "Secret Sauce"

- mobile key

- wearable key

Save only the wearable key.

mobile key

0	0	1	0	...	1	0

wearable key

1	0	1	1	...	0	1

The "Secret Sauce"

- mobile key

Initiate a notarization request.

mobile key

0	0	1	0	...	1	0

mobile key

0	0	1	0	...	1	0

wearable key

1	0	1	1	...	0	1

The "Secret Sauce"

- mobile key
- wearable key

Load the saved wearable key.

mobile key

0	0	1	0	...	1	0

wearable key

1	0	1	1	...	0	1

mobile key

0	0	1	0	...	1	0

wearable key

1	0	1	1	...	0	1

The "Secret Sauce"

- mobile key
- wearable key
- **notary key**

Derive the private notary key.

| 0 | 0 | 1 | 0 | ... | 1 | 0 |

XOR

| 1 | 0 | 1 | 1 | ... | 0 | 1 |

⇩

| 1 | 0 | 0 | 1 | ... | 1 | 1 |

notary key

mobile key

| 0 | 0 | 1 | 0 | ... | 1 | 0 |

wearable key

| 1 | 0 | 1 | 1 | ... | 0 | 1 |

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The "Secret Sauce"

- mobile key
- wearable key
- notary key
- notary seal

Generate the public notary seal.

notary seal

0	1	0	0	...	1	0

⇧

1	0	0	1	...	1	1

notary key

wearable key

1	0	1	1	...	0	1

mobile key

0	0	1	0	...	1	0

The "Secret Sauce"

- mobile key
- wearable key
- n~~otary key~~
- notary seal

Return the notary seal.

notary seal

| 0 | 1 | 0 | 0 | ... | 1 | 0 |

mobile key

| 0 | 0 | 1 | 0 | ... | 1 | 0 |

wearable key

| 1 | 0 | 1 | 1 | ... | 0 | 1 |

The "Secret Sauce"

- mobile key

- wearable key

Ready for the next request.

mobile key

0	0	1	0	...	1	0

wearable key

1	0	1	1	...	0	1

◆ In Summary ◆

The patented Wearable Identity System provides a simple and secure way to prove your identity using your mobile device by digitally notarizing any document enabling the:

- automatic unlocking of your computer or mobile device
- execution of fraud-proof financial transactions with merchants or banks

◆ More Information ◆

patent: https://patents.google.com/patent/US9853813B2

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