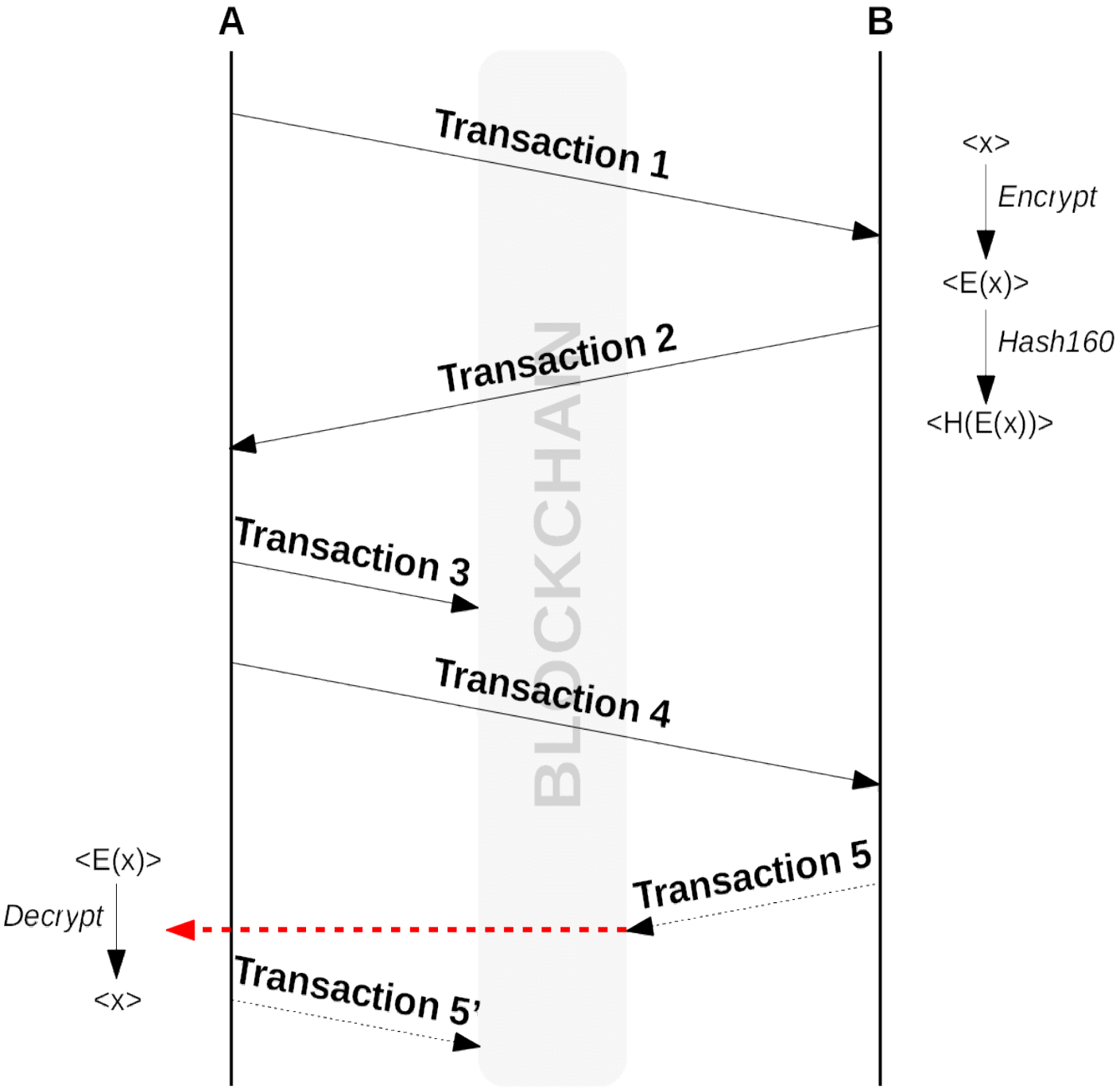
Purchase coupon in the Blockchain

I. Example of protocol

Let's say that B wants to sell a coupon <x> for N smly and that A would like to buy it …



Transaction1 and Transaction2 prepare the information necessary for Transaction3:

Transaction1
amount: `0`
type: `TX_NULL_DATA`
scriptPubKey: `OP_RETURN <I want to buy a coupon>`

Transaction2
amount: `0`
type: `TX_NULL_DATA`
scriptPubKey: `OP_RETURN <H(E(x))>`

Transaction3 is the protocol's main transaction:

Transaction3
amount: `N`
type: `TX_NONSTANDARD`
scriptPubKey:
```
OP_IF
 | <PubKeyA> OP_CHECKSIGVERIFY
OP_ELSE
 | OP_HASH_160 <H(E(x))> OP_EQUAL <PubKeyB> OP_CHECKSIGVERIFY
OP_ENDIF
```

Transaction4 gives B the Transaction3's "txid":

Transaction4
amount: `0`
type: `TX_NULL_DATA`

Now, either B spend Transaction3 and so A will have access to <E(x)> and can decrypt it to obtain <x>...

Transaction5
scriptSig: `<sigB><E(x)>`

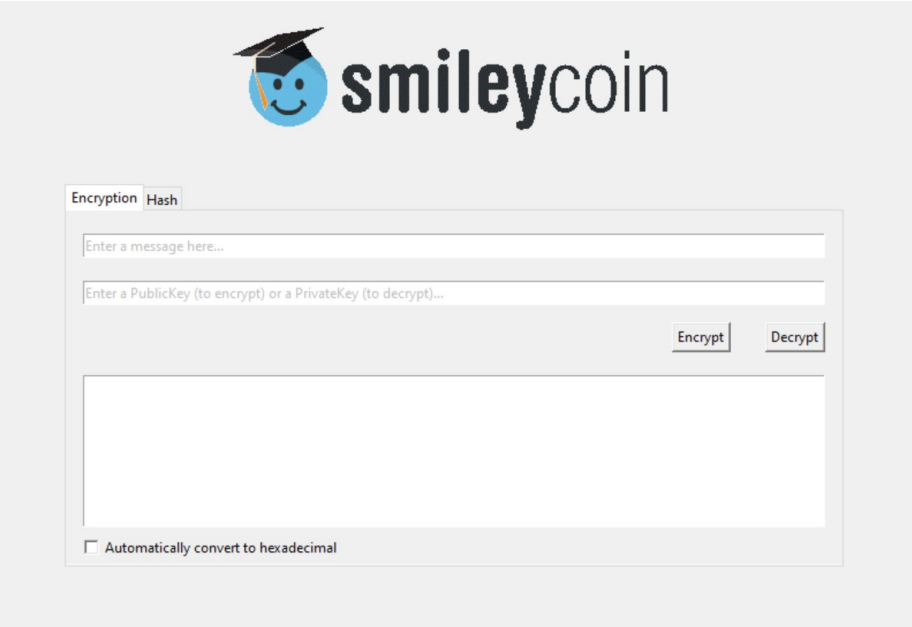
Or B does not spend Transaction3. A will never know <x> but can get his N smly back.

Transaction5'
scriptSig: `<sigA>`

II. New tools for Smileycoin

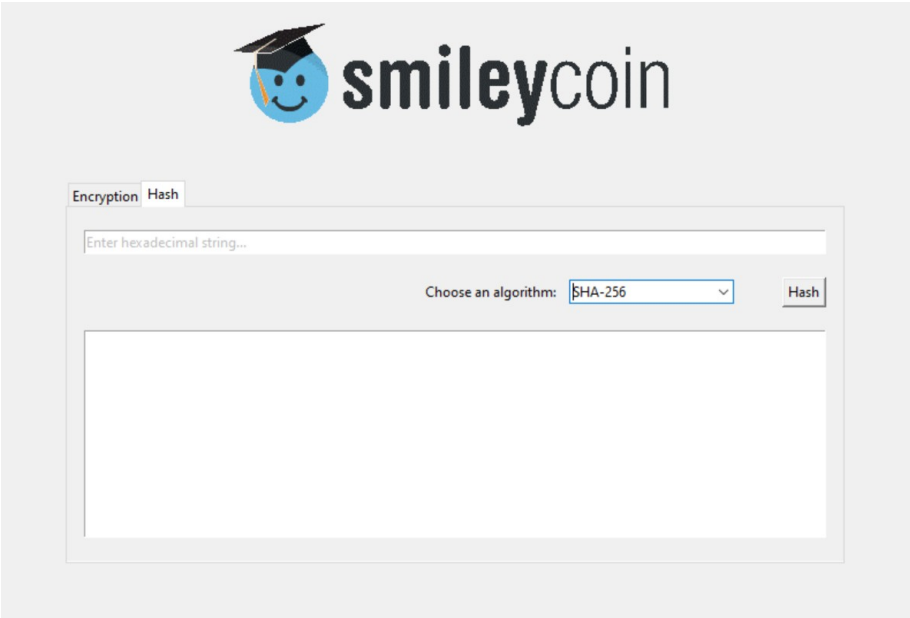
The code is available on github: `https://github.com/guighienne/PurchaseInBlockchain`

1. Encrypt/Decrypt a message



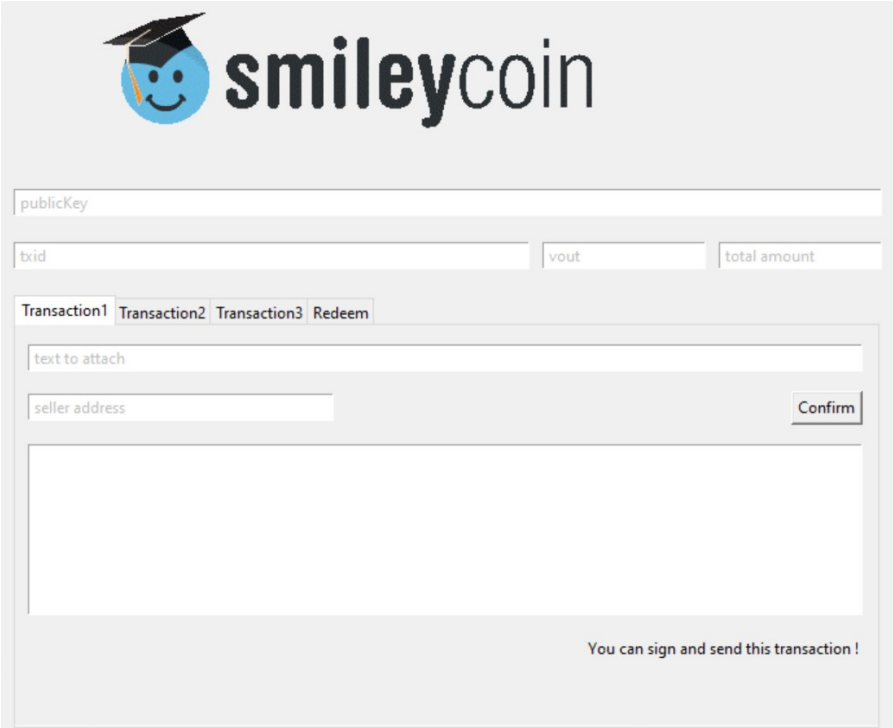
To encrypt a message, enter the message and provide the recipient's Public Key. Click on "Encrypt". At any time, you can switch from plain text to hexadecimal (and vice versa) string by checking / unchecking the box.
To decrypt, enter the encrypted message and provide the Private Key corresponding to the Public Key for encryption. Click on "Decrypt".

2. Hash a message



To hash a message, enter the message (in hexadecimal format), choose an algorithm and click on "Hash".
The algorithms available are the 5 algorithms recognized by Bitcoin Script:
- Ripemd-160
- Sha-1
- Sha-256
- Hash-160 (Ripemd-160 [Sha-256 [x]])
- Hash-256 (Sha-256 [Sha-256 [x]])

3. Create transactions



This tool allows you to easily create the transactions described in the protocol. Whether you are seller or buyer, you must provide an unspent transaction (txid, vout, total amount), a Public Key as well as various information depending on the transaction you are creating (previous transaction, coupon, or coupon price for example ...).
Apart from the Redeem Transaction, the transactions are easy to sign (`smileycoin-cli signrawtransaction 'TX'`). The Redeem Transaction is automatically signed in the tool. You just have to send it (`smileycoin-cli sendrawtransaction 'TX-signed'`).

III. Continuation…

- Incorporate the new tools directly into the Smileycoin Wallet
- Modify IsStandard () to be able to send transaction 3 in the blockchain