Will-wallet: A Peer-to-Peer Trustless custodian solution.

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Abstract: Bitcoin protected by unbreakable cryptography. This attribute makes it a secure way to store wealth, but also creates the risk that when Bitcoin owner pass without passing on the private key, his heirs may discover his wallet only to realize that they will never gain access to the wealth inside. To prevent this, the owner must ensure someone gets a copy of the private key or entrusting it with a commercial service that manages them. Some of these methods come with their own perils and difficult to rely on.

Will-wallet: Aiming to solve problems we encounter when it comes to digital asset custody. The solution proposed in this paper improve your digital assets to be transferred safely to the rightful heirs without trusting 3nd party and enables you to maintain full Control of your fund, make some changes if necessary, without any concern of losing asset or bear unnecessary costs.

The following example below illustrates, how this can be achieved by using will-wallet on Bitcoin network.

Create address: http://will-wallet.com/#newAddress

1st Will sender address

Address

bc1qdg6z5ulq036k7f6jkfzup6addvpna0qlaxsz5h

Redeem Script

6a342a73e07c756f2752b245c0ebad6b033ebc1f

Address Public key

Private key

L4S2cgu1YjUP7M1F87wG6kjUyCXtJvXAsNqNNrncR7qeqWpdNSM2

2nd will sender address (optional but recommended)

ddress

bc1qceq6s66e3f7emydcfalxur6tpdvdzkxl7hskwn Redeem Script

c641a86b598a7d9d91b84f7e6e0f4b0b58d158df

Public key

03147f71af984c870fd036e7eb276ed121f76b3dd95e6261a3c6bbe5c6a154184d

Private key

L2TktDeSDZHgeNdzqCe3xG1jZNzNA2E69nrG3XC8fbhaxxmwmRuu

Will receiver address (For practical, real-world application receiver only need to provide public key)

Address bc1q33s636j9pvmsvfhujxvh0u50n8kwpgcnyfvq6s

Redeem Script

8c61a8ea450b370626fc919977f28f99ece0a313

Public kev

03c886136a0e2038ed318a541fc3aa54a4b3922f70caef209c51cc91f9f801fb54

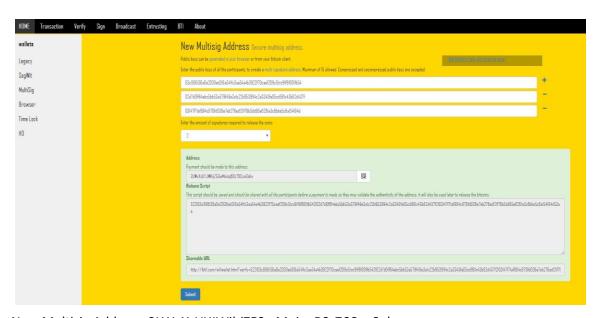
Private kev

L5TXCc9fX1GJ1fb3YQqLDRJt8y3RfTcyCkM88YAdhkApcv6Vgf

Create Multisig Address http://will-wallet.com#newMultiSig

Create a multi signature address using (will receiver address_1st address Will sender, 2nd address will sender.)

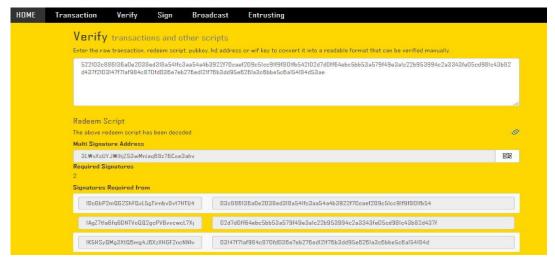
Crating (2, 3) Multisig address, enables you to control the two private keys needed to make some change if necessary, after we set up the will to be transferred on a specific future date, during that time you have full control of the fund to adjust or sign it to different receiver if needed



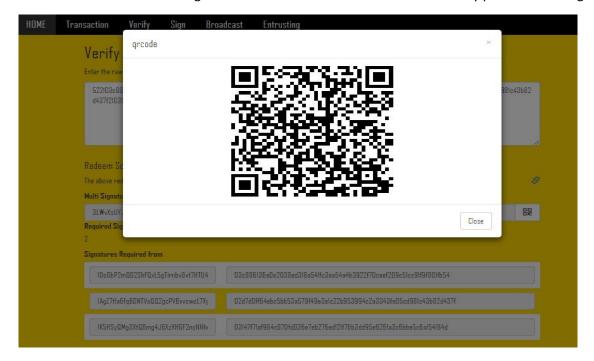
New Multisig Address: 3LWvXsUYJWihjZ53wMniaqB8z76Coe3ahv

Redeem Script

 $522103c886136a0e2038ed318a541fc3aa54a4b3922f70caef209c51cc91f9f801fb542102d7d0ff64ebc5bb53a579f49e3a1c22b953994c2a3343fe0\\ 5cd981c43b82d437f2103147f71af984c870fd036e7eb276ed121f76b3dd95e6261a3c6bbe5c6a154184d53ae\\ \underline{\text{http://will-wallet.com\#verify}}$



Step 2
Send the desired amount of digital asset like to include in the will to the newly produce Multisig address.

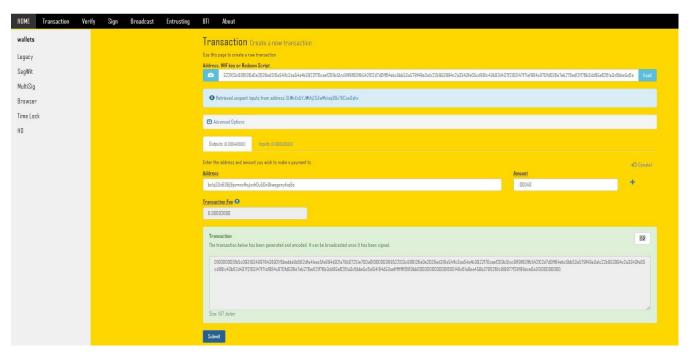


Create a new transaction: http://will-wallet.com/#newTransaction

Create a transaction to the Will receiver address:bc1q33s636j9pvmsvfhujxvh0u50n8kwpgcnyfvq6s using the Multisig redeem script from step 1.

In this step, if we have more fund in the address then we like to include in this will or we need to send for several will receiver we can adjust that by including our return address or other receiver address.

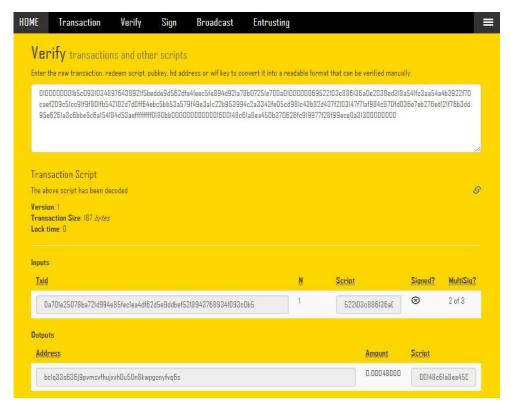
For this example, only one receiver gets the entire fund.



Raw transaction

 $0100000001b5c09310348976438921f5bedde9d562dfa41eec5fe894d921a78b07251e700a0100000069522103c886136a0e2038ed318a541fc3aa54a4b3922f70\\ caef209c51cc91f9f801fb542102d7d0ff64ebc5bb53a579f49e3a1c22b953994c2a3343fe05cd981c43b82d437f2103147f71af984c870fd036e7eb276ed121f76b3\\ dd95e6261a3c6bbe5c6a154184d53aefffffff0180bb00000000001600148c61a8ea450b370626fc919977f28f99ece0a3130000000$

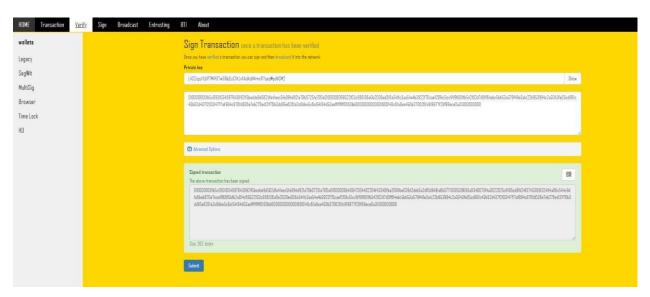
Verify



Sign transaction: http://will-wallet.com/#sign

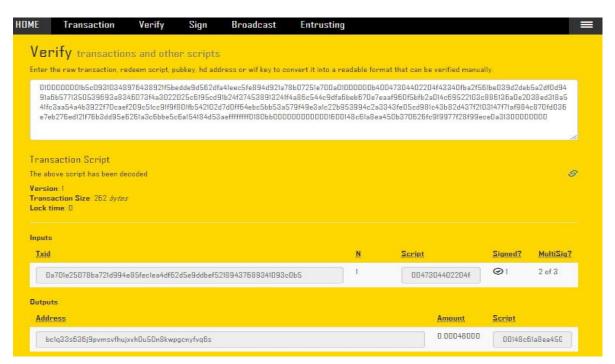
Using 1st privet key of Will sender we sign the Raw transaction

Private Key (WIF key): L4S2cgu1YjUP7M1F87wG6kjUyCXtJvXAsNqNNrncR7qeqWpdNSM2



This transaction has been signed with one private key.

 $0100000001b5c09310348976438921f5bedde9d562dfa41eec5fe894d921a78b07251e700a0100000b40047304402204f43340fba2f561be039d2\\ deb5a2df0d9491a6b5771350539693a8346073f4a3022025c6195cd91b24f374538913241f4a86c544c9dfa6beb670e7eaaf960f5bfb2a014c69522\\ 103c886136a0e2038ed318a541fc3aa54a4b3922f70caef209c51cc91f9f801fb542102d7d0ff64ebc5bb53a579f49e3a1c22b953994c2a3343fe05cd\\ 981c43b82d437f2103147f71af984c870fd036e7eb276ed121f76b3dd95e6261a3c6bbe5c6a154184d53aefffffff0180bb000000000001600148c6\\ 1a8ea450b370626fc919977f28f99ece0a31300000000$

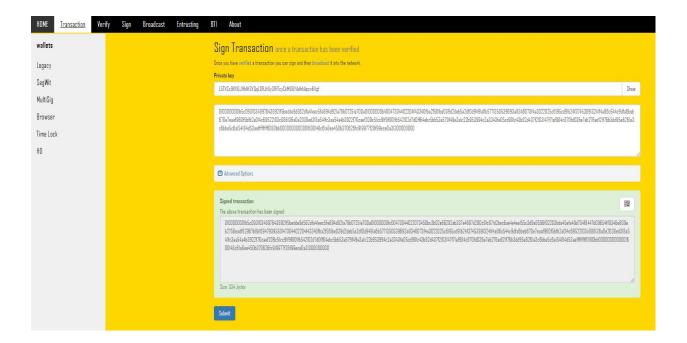


Using 3RD PARTY smart contract, delayed text/email message or personal custodian, set up to deliver the raw transaction to <u>Will receiver</u> at a specific future date or circumstance.

The need for the 3RD party here is precisely what you chose, but it comes after the contract being enforced, not before. For that reason, the fund is safe even if the raw transaction held by a 3rd party or become public.

The above Signed raw transaction can't be executed without one of the remaining two privet keys. One held by the receiver and the other held by the sender. In case the receiver gets the raw transaction before the intended time, we can include time lock to the receiver address.

When the will receiver gets the half signed raw transaction, can now Proceed to sign it with his/her privet key and broadcast to receive the digital asset.



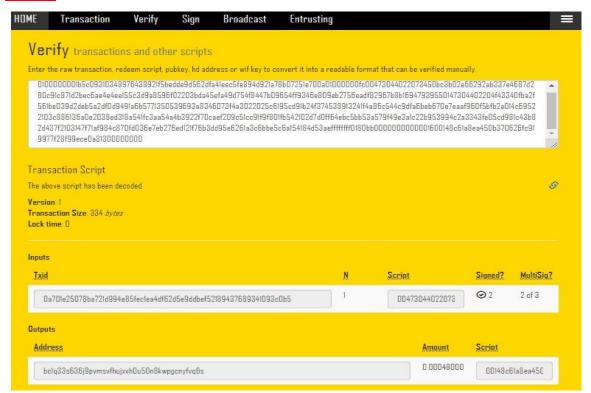
Fully Signed transaction ready to be broadcast

 $\mathbf{1}^{\text{st}}$ signed by one of the sender privet key.

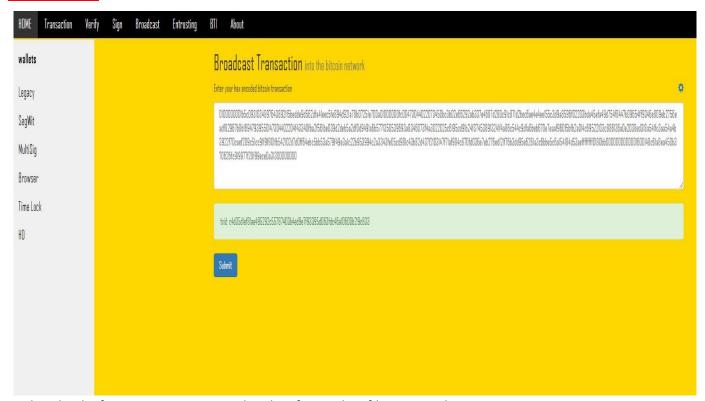
 2^{nd} signed by will receiver privet key.

 $0100000001b5c09310348976438921f5bedde9d562dfa41eec5fe894d921a78b07251e700a01000000fc00473044022073450bc3b02e66292ab337e4687d280c9\\ 1c871d2bec6ae4e4ee155c3d9a8596f02203bda45efa49d754f8447b09654ff9346e809eb2756eadf82967b8b16947939550147304402204f43340fba2f561be039\\ d2deb5a2df0d9491a6b5771350539693a8346073f4a3022025c6195cd91b24f374538913241f4a86c544c9dfa6beb670e7eaaf960f5bfb2a014c69522103c886136\\ a0e2038ed318a541fc3aa54a4b3922f70caef209c51cc91f9f801fb542102d7d0ff64ebc5bb53a579f49e3a1c22b953994c2a3343fe05cd981c43b82d437f2103147f\\ 71af984c870fd036e7eb276ed121f76b3dd95e6261a3c6bbe5c6a154184d53aeffffffff0180bb00000000001600148c61a8ea450b370626fc919977f28f99ece0a31300000000$

Verify http://will-wallet.com/#verify

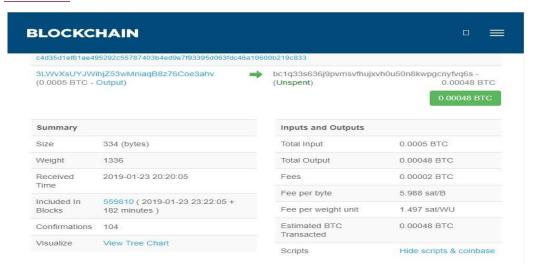


Broadcast http://will-wallet.com/#broadcast



txid: c4d35d1ef81ae495292c55787403b4ed9e7f93395d063fdc46a10600b219c833

https://www.blockchain.com/btc/tx/c4d35d1ef81ae495292c55787403b4ed9e7f93395d063fdc46a1060 0b219c833



Now as you can see the fund is in the Will receiver address.

DONE...

Option

To solve early release of fund in the case of receiver get the raw half signed transaction before the intended time or we like to give the raw transaction to the receiver without involving 3rd party to hold until the intended time.

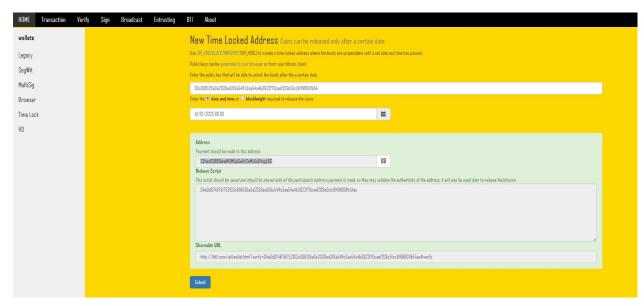
Include Step 2.5

OP_CHECKLOCKTIMEVERIFY: http://will-wallet.com/#newTimeLocked

Create New Time Locked Addresses from the original Public keys of the <u>Will receiver</u> and the fund can be released only after a certain specific date the sender set up.

OP_CHECKLOCKTIMEVERIFY (OP_HODL) to create a time locked address where the funds cannot be spent until a set date and time has passed.

Public key of receiver: 03c886136a0e2038ed318a541fc3aa54a4b3922f70caef209c51cc91f9f801fb54



Fund release date set by sender 01/01/2025 00:00 transaction should be made to this receiver

address: 32twaD5B69wwMUMUpQwErCeMuEoD4sgLBC

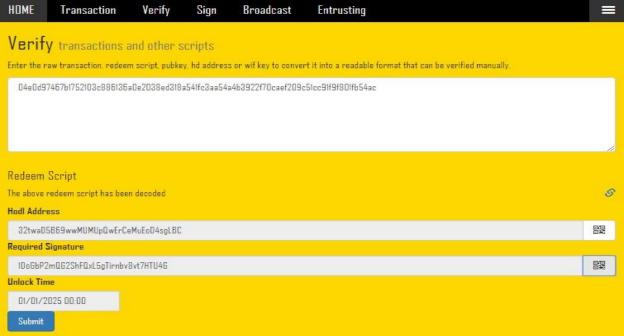
Redeem Script

This script should be saved and should be shared with all the participants before a payment is made, so they may validate the authenticity of the address, it will also be used later to release the bitcoins.

 $04e0d97467b1752103c886136a0e2038ed318a541fc3aa54a4b3922f70caef209c51cc91f9f801fb54ac\ Required$

Signature

1DoGbP2mQG2ShFQxL5gTirnbv8vt7HTU4G



Then repeat the same process from Step 3.

Will wallet:

Provide much more versatility, security and flexibility without 3rd party trust.

- 1. Digital asset can be released any time before the receiver receives the signed transaction by the sender if necessary.
- 2. The fund can be used any time before the receiver excite the transaction. If the fund replaced with adequate funding the transaction still be executable upon broadcast.
- 3. If things change, receiver no longer need it or lost his personal wallet privet key it can be resigned to a different receiving address, with the two pk the sender hold.
- 4. We can also include more than one wallet address in one transaction for someone want his asset to be divided between several receivers.
- 5. Only one receiver required to sign the second signature and broadcast the transaction. All receive the fund into their personal wallet simultaneously.

Conclusion

Will wallet solve the problem of transferring inheritance or any found upon unfortunate circumstance like the holder of digital asset passing or any reasons restrict the holder to transfer his/her asset if setup ahead. The possibility of this method is not limited to the above use case, it can be implemented in different custodian solution like estate transferal, monthly payout trust fund, insurance payout and exchanges. It also can be implemented for any digital asset support multi signature wallet.

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References

[1] "https://github.com/OutCast3k/coinbin/.

[2] Tomoya Ishizaki, " https://github.com/bitcoin/bips/blob/master/bip-0065.mediawiki "