

Virtual Assets



Loughnane Associates LLC
Value Touches Everything

Learning Objectives:

Incorporate an understanding of the various virtual currencies and how they affect financial investigations.

ELO 1 Define virtual currency and discuss the market

ELO 2 Describe the process flow of virtual assets.

ELO 3 Introduction to bitcoin transaction analysis



Define Virtual Currency

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Convertible Virtual Currency

- A medium of exchange that operated like a currency in some environments
- Does not have legal tender status
- Convertible virtual currency (CVC) has an equivalent value in real currency or acts as a substitute for real currency

“New types of anonymity-enhanced CVCs have emerged that further reduce the transparency of transactions and identities as well as obscure the source of the CVC through the incorporation of anonymizing features, such as mixing and cryptographic enhancements”

“Mixing or tumbling involves the use of mechanisms to break the connection between an address sending CVC and the addresses receiving CVC. “



FinCEN. (2019, May). Advisory on Illicit Activity Involving Convertible Virtual Currency. <https://www.fincen.gov/sites/default/files/advisory/2019-05-10/FinCEN%20Advisory%20CVC%20FINAL%20508.pdf>

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Blockchain.com The Cryptocurrency (Virtual Asset) Market

Cryptocurrency Prices
11786 Assets

The cryptocurrency market is valued at \$1.7T, and on average a -1.71% decrease over the last day. The total marketcap for stablecoins is \$131.6B. The total marketcap for DeFi is \$76.8B.

The total crypto market volume over the last 24 hours is \$100.3B. The total volume in DeFi is \$6.5B, 6.48% of the total crypto volume. The volume for stablecoins is \$66.3B, which is 66.11% of the total crypto market 24-hour volume.

Bitcoin's price is currently \$42,273.00

BTC currently makes up 48.20% of the value of the crypto ecosystem, total ecosystem volume is currently \$100,341,847,988.

Chart
Bitcoin 163.85%
Ethereum 91.27%
December 25, 2023

USD \$1.7 T

USD \$42,273

48.2%

Name	Price	1d	Market Cap	Volume(24h)	7d Chart	Trade
Bitcoin BTC	\$42,273.00	-2.49%	\$828,533,534,476	\$28,527,174,200		
Ethereum ETH	\$2,220.35	-2.06%	\$267,156,749,591	\$16,060,274,350		

English

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The Bitcoin Process

Who is Satoshi Nakamoto?

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What is Bitcoin?

- An electronic payment system based on mathematical proof
- Decentralized
- Low transaction fees?
- Built on a "Blockchain" technology which ties to a PKI infrastructure
 - Public Key
 - Private Key
 - Proof - of - Work
- Owner is determined by the last transaction

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The Transaction Process

- Requires a Bitcoin wallet, a Bitcoin, and a wallet address
- Addresses are maintained in the wallets
- Transactions are placed in a Transaction Block for authentication using addresses
- Authenticated by "Bitcoin Miners" who get paid in Bitcoin attack the block and then authenticate each transaction within
- Transaction is verified and distributed to public ledgers

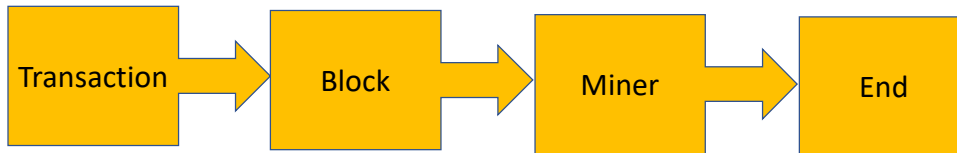
Who is Satoshi Nakamoto?

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The Transaction Process Flow



Mark wants to send 1 BTC to Jessica. He uses his private key to 'sign' a message with the transaction-specific details.

.6 BTC + .6 BTC to Jessica
(.2 BTC returned to Mark)

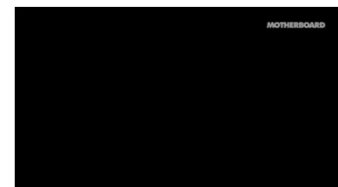
Mark's transaction is placed in a Transaction Block with other transactions.

This Block is ciphered and then is attacked by Bitcoin Miners.

Whichever Miner breaks it first gets to authenticate the transactions

Miners authenticate transaction in blocked and are paid for the process

About 10 minutes after transaction approval is given and it completes



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Available Transaction Views

Public View

Sender's bitcoin address
Recipient's bitcoin address
Amount
Timestamp

Blockchain.info

Exchange View

Sender ID (on file)
All MSB users that have transacted with the address
All transaction notes
ID information, complete profile and transaction history

KYC Requirements
Transaction Monitoring

3rd Party Services

Mapping addresses on the blockchain to identify source and destination of funds

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Blockchain.com home page

USD **Bitcoin BTC** \$42,272.04 -2.87% -1,247.57

Latest Blocks

- 823,064 26 Dec 2023 • 04:39:00 GMT-5 3,816 Txs • 1.65 Mb
- 823,063 26 Dec 2023 • 04:34:50 GMT-5 3,158 Txs • 1.60 Mb
- 823,062 26 Dec 2023 • 04:21:57 GMT-5 3,341 Txs • 1.71 Mb
- 823,061 26 Dec 2023 • 04:21:07 GMT-5 4,246 Txs • 1.66 Mb
- 823,060 26 Dec 2023 • 04:05:46 GMT-5 2,895 Txs • 1.48 Mb

Prices

Asset	Price	% Change
Bitcoin BTC	\$42,269.00	-2.41%
Ethereum ETH	\$2,220.65	-2.11%
Solana SOL	\$108.72	-8.24%
BNB BNB	\$296.32	+11.58%
XRP XRP	\$0.62	-3.46%

Latest Transactions

TX ID	Time	Amount	Asset	Price
02999-eba8a	16:45:22	0.00005000	BTC	\$2.11
ccc3-7500f	16:45:22	0.00170372	BTC	\$72.04
0909c-79094	16:45:23	1.74055108	BTC	\$73,600.68
95c1a-e838c	16:45:22	0.02988300	BTC	\$1,263.63
5a1d0-815b8	16:45:22	0.05850243	BTC	\$2,473.82

Bitcoin Cash BCH \$227.75 -3.16% -7.44

825,433 2.66 EH/s

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ac860c12468efc892d7adcb5cee561926b6476293ca419dcd5b144752cc3d1b6

Block →

Bitcoin Block 823,064 ←

Mined on December 26, 2023 04:39:00 • All Blocks

Unknown

Coinbase Message • tG e/Foundry USA Pool #dropgold/ W B/

A total of 2,244.11 BTC (\$94,894,283) were sent in the block with the average transaction being 0.5881 BTC (\$24,868.31). Unknown earned a total reward of 6.25 BTC \$264,286. The reward consisted of a base reward of 6.25 BTC \$264,286 with an additional 1.3672 BTC (\$57,813.21) reward paid as fees of the 3,816 transactions which were included in the block.

Details

Property	Value	Property	Value
Hash	00000-37a2e	Depth	1
Capacity	164.62%	Size	1,726,155
Distance	10m 32s	Version	0x24000000
BTC	2,244.1144	Merkle Root	7e-f0
Value	\$94,894,283	Difficulty	72,006,146,478,567.10
Value Today	\$94,843,251	Nonce	168,437,917
Average Value	0.5880802822 BTC	Bits	386,132,147
Median Value	0.00000546 BTC	Weight	3,993,036 WU
Input Value	2,245.48 BTC	Mined	6.25 BTC

Transactions

0 ID: b8e8-6cb4 12/26/2023, 16:39:00 From Block Reward 7.61719400 BTC • \$322,099
To 2 Outputs Fee 0 Sats • \$0.00

1 ID: ebd5-b1ff 12/26/2023, 16:37:24 From 34 Inputs 16.49876243 BTC • \$697,664
To 2 Outputs Fee 1.1M Sats • \$455.90

2 ID: cf02-3e62 12/26/2023, 16:39:00 From bc1q-xwjw 0.00196251 BTC • \$82.99
To 2 Outputs Fee 18.1K Sats • \$7.63

3 ID: 5364-9475 12/26/2023, 16:39:00 From bc1p-ttm5 0.00000500 BTC • \$0.21
To bc1q-xwjw Fee 87.6K Sats • \$37.02

4 ID: 3ce8-8677 12/26/2023, 16:36:52 From bc1q-yz5z 0.01220519 BTC • \$516.11
To bc1q-np9r Fee 35.5K Sats • \$15.00

5 ID: 8773-0961 12/26/2023, 16:39:00 From bc1q-2vpp 13.67433739 BTC • \$578,230
To 2 Outputs Fee 55.6K Sats • \$23.53

6 ID: cf82-9cdb 12/26/2023, 16:39:00 From bc1q-2vpp 0.34777806 BTC • \$14,706.09
To 2 Outputs Fee 55.6K Sats • \$23.53

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Amount 0.00196251 BTC • \$83.03
Fee 18,054 SATS • \$7.64

From To bc1q2-4xwjw
 2 Outputs

Confirmed

This transaction has 2 Confirmations. It was mined in Block 823,064

This transaction is efficient, no issues detected.

This transaction was first broadcasted on the Bitcoin network on December 26, 2023 at 04:12 AM GMT-5. The transaction currently has 2 confirmations on the network. The current value of this transaction is now \$83.03.

Advanced Details			
Hash	cf02-3e62	Block ID	823,064
Position	2	Time	26 Dec 2023 04:39:00
Age	14m 35s	Inputs	1
Input Value	0.00214305 BTC	Outputs	2
	\$90.67	Output Value	0.00196251 BTC
Fee	0.00018054 BTC		\$83.03
	\$7.64	Fee/B	77,154 sat/B
Fee/VB	118,000 sat/vByte	Size	234 Bytes
Weight	609	Weight Unit	29,645 sat/WU
Coinbase	No	Witness	Yes
RBF	No	Locktime	0
Version	2	BTC Price	\$42,309.49

Overview JSON

From

1 bc1q2wznangqd66dyapgcw2qe9add9fv8uxqk4...
 0.00214305 BTC • \$90.67

Change Address
New UTXO

bc1p5wqz3fw97ktf62gh953ljwhpskxjm3z6zhnd...
 0.00088056 BTC • \$37.26

bc1q2wznangqd66dyapgcw2qe9add9fv8uxqk4xw...
 0.00108195 BTC • \$45.78

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Tracing transactions in the blockchain

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What story can you see in this transaction?

Blockchain.com Wallet Exchange Explorer Buy Bitcoin Trade

Summary USD BTC

This transaction was first broadcast to the Bitcoin network on April 21, 2021 at 8:10 AM EDT. The transaction currently has 2 confirmations on the network. At the time of this transaction, 0.28324024 BTC was sent with a value of \$15,526.79. The current value of this transaction is now \$15,718.92. Learn more about how transactions work.

Hash	Amount	Date
043000d5fdf9602ad5adbee3b063d047b1384dc7189deba835...	2021-04-21 08:10	
1MUvgqe48G33qo1guHz3ypD3udLnRJeRA4	0.12350422 BTC	0.01506969 BTC
1pVGyX1U9JgeERdsiTc6zdmQQzR55eHT9	0.16020304 BTC	0.00110000 BTC
		0.00349123 BTC
		0.02980000 BTC
		0.01355008 BTC
		0.00087608 BTC
		0.19951096 BTC
		0.01984220 BTC

Fee: 0.00046702 BTC (81.790 sat/B - 20.447 sat/WU - 571 bytes)

0.28324024 BTC
2 Confirmations

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What to look for

ACH Data (formatted to NACHA guidelines)

- Trace Number
- Batch Name/Number
- Company Entry Description
- Standard Class Entry Code
- ODFI/RDFI Identification Number
- ODFI/RDFI Account Numbers
- Type of Transaction/Transaction Code
- Recipient Name/Identification Number
- Recipient Account Number
- Sender Name
- Sender RDFI Account Number

SWIFT Message Data

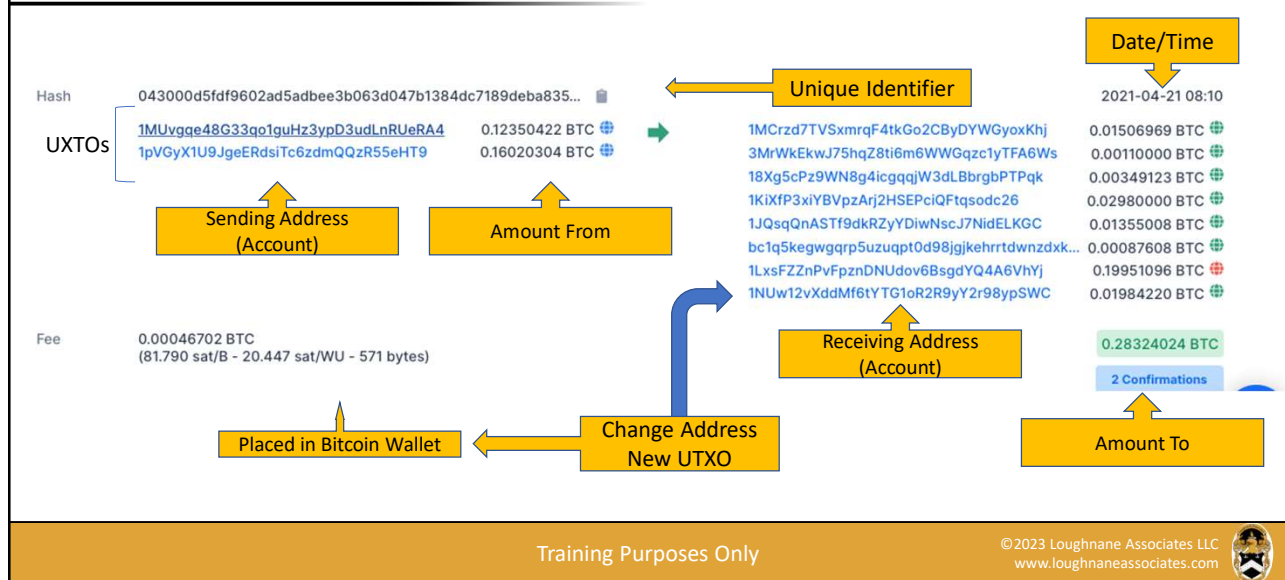
```

Sent to SWIFT : ACK
Network Priority : Urgent
Message Input Reference : 0950 date BNGRGRAAXXX 0027 007653
SWIFT Input : Notification
FIN MT103 single customer credit transfer
Sender : BNGRGRAA
Receiver : ABCCOZXA
MUR : BANK PRIORITY
20 : RW/001
23B : CRED
23E : PNYB/555-333-1111
32A : 03301BEUR111757
50K : COLOMBO COMPANY
FREE TRADE ZONE
DURAL LIFE
59 : /12345678901234
ANTHONY ZABARA
100 CRIME STREET
ATHENS GREECE
70 : PAYMENT OF DIRECTOR BONUS
71A : SWA
    
```

- Response Acknowledgement (NACK, FIN)
- Message Type 103: Order to Pay Beneficiary
- ODFI: Bank of Greece, Greece, Athens
- RDFI: ABB Capital, Switzerland, Zurich
- Phone Number
- Amount
- Sender: Company Location
- Recipient: Anthony Zabara, Address
- Free Text Area

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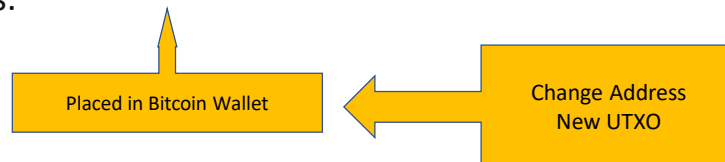
The information Is here



Unspent Transaction Output (UTXO)

(<https://academy.binance.com/en/glossary/unspent-transaction-output-utxo>)

- A transaction output that can be used as input in a new transaction.
 - Each input in a new transaction is an output in a previous transaction
- UTXOs define where each blockchain transaction starts and finishes.
- The UTXO model is a fundamental element of Bitcoin and many other cryptocurrencies.



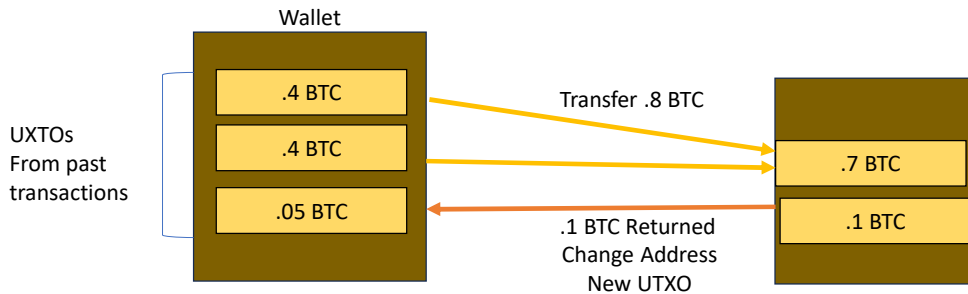
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Common Input Ownership Heuristic

Change Address
New UTXO



If a transaction has multiple inputs those distinct addresses are all contained within the same wallet and controlled by the same individual

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Identifying the owner



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Working with the Public View



15K9Zj1AU2hjT3ebZMtWqDsMv3fFxTNwpf

15K9Zj1AU2hjT3ebZMtWqDsMv3fFxTNwpf

Play Slots & Win! Win 8.88 BTC 5 BTC Free Bonus B

There are 2 blockchains with result(s) to your search:

15K9Zj1AU2hjT3ebZMtWqDsMv3fFxTNwpf

BTC Address 15K9Z-TNwpf

BCH Address 15K9Z-TNwpf

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Address used:
23 times
Total Received:
\$3,896.18
Total Sent:
\$3,857.05
Current Value:
\$39.13

15K9Zj1AU2hjT3ebZMtWqDsMv3fFxTNwpf			
Summary		Total Received	Total Sent
This address has transacted 23 times on the Bitcoin blockchain. It has received a total of 0.09036343 BTC \$3,896.18 and has sent a total of 0.08945595 BTC \$3,857.05. The current value of this address is 0.00090748 BTC \$39.13.		0.09036343 BTC \$3,896.18	0.08945595 BTC \$3,857.05
		Transactions	23
Transactions			
ID: 79dc-b22b 11/05/2020, 09:31:21	From 16wb-AVWd To 2 Outputs	0.00006300 BTC • \$2.72 Fee 671K Sats • \$28.94	
ID: f73a-5ebc 11/05/2020, 09:05:02	From 1M6q-etiC To 2 Outputs	0.00004200 BTC • \$1.81 Fee 111.1K Sats • \$47.89	
ID: 584e-c54e 10/26/2020, 01:59:48	From 19ao-3rqj To 2 Outputs	0.00001000 BTC • \$0.43 Fee 29.1K Sats • \$12.56	
ID: 3f1c-d922 10/26/2020, 01:59:48	From 1Dde-gnvF To 2 Outputs	0.00006000 BTC • \$2.59 Fee 20.5K Sats • \$8.86	
ID: c78a-ce86 10/26/2020, 01:12:11	From 1qnx-fMZW To 2 Outputs	0.00005000 BTC • \$2.16 Fee 29.1K Sats • \$12.56	
ID: 34ba-ceb4 10/26/2020, 02:47:57	From 1x5t-2Bu To 2 Outputs	0.00002000 BTC • \$0.86 Fee 904 Sats • \$0.39	
ID: 8028-4b7d 10/26/2020, 01:55:30	From 17Ae-gfX To 2 Outputs	0.00003200 BTC • \$1.38 Fee 904 Sats • \$0.39	
ID: 4c5f-114d 10/26/2020, 01:41:01	From 1Hf-LgFW To 2 Outputs	0.00005550 BTC • \$2.39 Fee 5.3K Sats • \$2.27	
ID: 0e27-2bb2 10/26/2020, 01:29:13	From 1D6m-gpam To 15K9-nwpf	0.00004000 BTC • \$1.72 Fee 4.6K Sats • \$1.98	

"Sats" = Satoshis
represent 1/100,000,000
(one hundred millionth)
Smallest bitcoin value

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16wBG-3AVWd

Bitcoin Balance: 0.00000000 • \$0.00

Summary

This address has transacted 2 times on the Bitcoin blockchain. It has received a total of 0.0009279 BTC (\$0.24) and has sent a total of 0.0009279 BTC (\$0.24). The current value of this address is: 0.00000000 BTC (\$0.00)

Transactions

Previous Transaction

From: 118021AU2hjT3ebZMtWqDsMv3fXTNwpf

To: 16wBG-3AVWd (0.0009279 BTC • \$0.24)

Anything here?

From: 106qy49PC

To: 16wBG-3AVWd (0.0009279 BTC • \$0.24)

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15K9Zj1AU2hjT3ebZMtWqDsMv3fXTNwpf

Summary

This address has transacted 23 times on the Bitcoin blockchain. It has received a total of 0.09036343 BTC (\$3,896.18) and has sent a total of 0.08945595 BTC (\$3,857.05). The current value of this address is 0.00090748 BTC (\$39.13).

Total Received: 0.09036343 BTC (\$3,896.18)

Total Sent: 0.08945595 BTC (\$3,857.05)

Current Value: 0.00090748 BTC (\$39.13)

Transactions

Address used: 23 times
Total Received: \$3,896.18
Total Sent: \$3,857.05
Current Value: \$39.13

"Sats" = Satoshis represent 1/100,000,000 (one hundred millionth) smallest bitcoin value

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15K9Z1AU2hT3ebZMWqDsMv3fXtNwpl

Sponsored: \$1,000,000 Jackpot & Provably Fair Casino Games [Click to win!](#) [Play Slots & Win!](#) [Win 8.88 BTC](#) [5 BTC Free Bonus B](#)

TX USD

Bitcoin Transaction

Broadcasted on 05 Nov 2020 08:05:02 GMT-5

Hash ID
f73a83969fca2ffc4ff3ffeca49b7579d5d1c3300bf41f9138897ab522d45ebc

Amount: 0.00100479 BTC • \$43.37
Fee: 111,078 SATS • \$47.94

From: 1M6qu-eetpC
To: 2 Outputs

Confirmed

This transaction has 167,664 Confirmations. It was mined in Block 655,530

This transaction paid ~40% more in fees due to inefficiencies associated with older wallets. [Learn More](#)

CRYPTOSLOTS
25 FREE JACKPOT SPINS

Summary

This transaction was first broadcasted on the Bitcoin network on November 05, 2020 at 08:11 AM GMT-5. The transaction currently has 167,664 confirmations on the network. The current value of this transaction is now \$43.37.

Advanced Details

Hash	f73a-5ebc	Block ID	655,530
Position	2124	Time	05 Nov 2020 08:05:02
Age	3y 1m 20d 6h 31m 43s	Inputs	2
Input Value	0.00211557 BTC	Outputs	2
Fee	\$91.31	Output Value	0.00100479 BTC
Fee/B	0.0011078 BTC	Fee/B	297.796 sat/B
Fee/VB	\$47.94	Size	373 Bytes
Weight	-	Weight Unit	74.449 sat/WU
Coinbase	1,492	Witness	No
RBF	No	Locktime	655,529
Version	No	BTC Price	\$43,159.56

Overview JSON

From

- 1 1M6qudUbrghs544uZvEtTRWLxANVeetpC • 0.00111557 BTC • \$48.15
- 2 1M6qudUbrghs544uZvEtTRWLxANVeetpC • 0.00100000 BTC • \$43.16

To

- 1 15K9Z1AU2hT3ebZMWqDsMv3fXtNwpl • 0.00004200 BTC • \$1.81
- 2 16wBGWBW7JSBxqjPZqHXa2GaJLsB3AV... • 0.00096279 BTC • \$41.55

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1M6qu-eetpC USD

Base58 (P2PKH)

Bitcoin Address
1M6qudUbrghs544uZvEtTRWLxANVeetpC

Bitcoin Balance
0.00000000 • \$0.00

BC.GAME GET 5 BTC FOR FREE + 1000% DEPOSIT BONUS CLAIM NOW

Wallet Chart

Summary

This address has transacted 7 times on the Bitcoin blockchain. It has received a total of 0.00392109 BTC \$164.97 and has sent a total of 0.00392109 BTC \$164.97. The current value of this address is 0.00000000 BTC \$0.00.

Total Received	0.00392109 BTC	Total Sent	0.00392109 BTC	Total Volume	0.00784218 BTC
Transactions	7				

Transactions

ID: f73a-5ebc

From: 1M6qu-eetpC
To: 2 Outputs

-0.00211557 BTC • -\$89.01
Fee: 111.1K Sats • \$46.73

From

- 1 1M6qudUbrghs544uZvEtTRWLxANVeetpC • 0.00111557 BTC • \$46.92
- 2 1M6qudUbrghs544uZvEtTRWLxANVeetpC • 0.00100000 BTC • \$42.87

To

- 1 15K9Z1AU2hT3ebZMWqDsMv3fXtNwpl • 0.00004200 BTC • \$1.77
- 2 16wBGWBW7JSBxqjPZqHXa2GaJLsB3AV... • 0.00096279 BTC • \$40.51

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Outgoing Tx

ID: **c1a2-33c3**
 2/05/2018, 11:35:43

Date/Timestamp

From **15K9-Nwpf**
 To **19ck-FDD8**

Addresses

Amount/Fees

-0.00600000 BTC • **-\$252.68**
 Fee 21.4K Sats • **\$9.01**

From

1 **15K9Zj1AU2hjT3ebZMtWqDsMv3fTxTNwpf**
 0.00600000 BTC • **\$252.68**

To

1 **19ckaZLPDzn7s2EcFtsjLobu71eAqWFDD8**
 0.00578611 BTC • **\$243.68**

Follow the trail

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Google Chrome

blockchain.com/explorer/addresses/BTC/19ckaZLPDzn7s2EcFtsjLobu71eAqWFDD8

Blockchain.com

19cka-WFDD8

Balances

BTC Balance **0.00000000** • **\$0.00**

Summary

This address has transacted 25 times on the Bitcoin blockchain. It has received a total of **0.23541508 BTC** (\$14,943.12) and has sent a total of **0.23541508 BTC** (\$14,943.12). The current value of this address is **0.00000000 BTC** (\$0.00).

Transactions

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Higher value transaction FROM

ID: a712-83b2 12/01/2017, 14:55:33

From 15K9-Nwpx To 1H9z-fhdk

-0.07574079 BTC • -\$3,188.25
Fee 24.7K Sats • \$10.41

From

1 15K9Zj1AU2hjT3ebZMtWqDsMv3IFxTNwpx 0.07574079 BTC • \$3,188.25

To

1 1H9zEVipYuFk81ZXFf1JtJKpn6vfhdk 0.07549354 BTC • \$3,177.84

Follow the trail

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1H9zE-vfhdk USD

Base58 (P2PKH)

Bitcoin Address 1H9zEVipYuFk81ZXFf1JtJKpn6vfhdk

Bitcoin Balance 0.00000000 • \$0.00

BC.GAME Santa's Gift PRIZE POOL \$100,000 GET YOUR PRIZE NOW

Summary

This address has transacted 3 times on the Bitcoin blockchain. It has received a total of 0.12649354 BTC \$5,328.59 and has sent a total of 0.12649354 BTC \$5,328.59. The current value of this address is 0.00000000 BTC \$0.00.

Total Received	Total Sent	Total Volume
0.12649354 BTC \$5,328.59	0.12649354 BTC \$5,328.59	0.25298708 BTC \$10,657.17

Transactions 3

ID	From	To	Amount	Fee
48fa-6aab 12/20/2017, 11:57:43	1H9z-fhdk	2 Outputs	-0.12649354 BTC • -\$5,328.59	266.2K Sats • \$112.13
a712-83b2 12/01/2017, 14:55:33	15K9-Nwpx	1H9z-fhdk	0.07549354 BTC • \$3,180.19	24.7K Sats • \$10.42
9ca6-2872 12/01/2017, 14:49:07	1H6L-iquo	2 Outputs	0.05100000 BTC • \$2,148.39	34.4K Sats • \$14.49

Let's talk about this one. What is the useful information here?

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Address → 1H9zE-vfhdk (Base58 (P2PKH) Bitcoin Address)

Balance → 0.00000000 • \$0.00

Summary → This address has transacted 3 times on the Bitcoin blockchain. It has received a total of 0.12649354 BTC \$5,328.59 and has sent a total of 0.12649354 BTC \$5,328.59. The current value of this address is 0.00000000 BTC \$0.00.

Outgoing/Incoming Dates of Use Amounts Associations →

ID	From	To	Amount	Fee
48f4-6aab	From 1H9z-fhdk	To 2 Outputs	-0.12649354 BTC	Fee 266.2K Sats • \$112.13
a712-83b2	From 15K9-Newpf	To 1H9z-fhdk	0.07549354 BTC	Fee 24.7K Sats • \$10.42
9cad-2872	From 1H4L-iquo	To 2 Outputs	0.05100000 BTC	Fee 34.4K Sats • \$14.49

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Methods To Identify an Address Owner



Methods To Identify an Address Owner

- Personal Information Posted: Collecting donations on a personal blog
- Posting an address on a website using their real name as owner of registered domain
- Use real identity in a forum with address
- Use of address in social media (Facebook, LinkedIn, etc.)
- Tracking Outside Purchases (name and shipping information?)
- Searching for Thin Client or Hosted Wallet Usage
- IP transactions traced by the Internet Service Provider
- Identify the exchange holding the account who logs transactions
- Using Transaction Analysis software firms such as Elliptic or Chainalysis

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Don't Forget The "Old School" Financial Investigation Methods

- How does the suspect purchase equipment and material related to the crime?
- Shipments are paid? - Cash? Credit Card? Debit Card? Prepaid Access?
- Track the credit card transactions
- Track the prepaid access cards
 - How is suspect loading them? At the counter at Walmart? What is suspect doing to load them?
- Is the Exchange account associated to a bank account?
 - Do the bank records show transfers/receipts from a VASP?
 - Where does the cryptocurrency convert to fiat? And what happens to the money?

Subpoenas, Warrants, Seizures, Interviews, Informants, Cellphone and Surveillance, and so much more

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Pocket Litter!

Element peach process pyrrhic...

Keep it!

35

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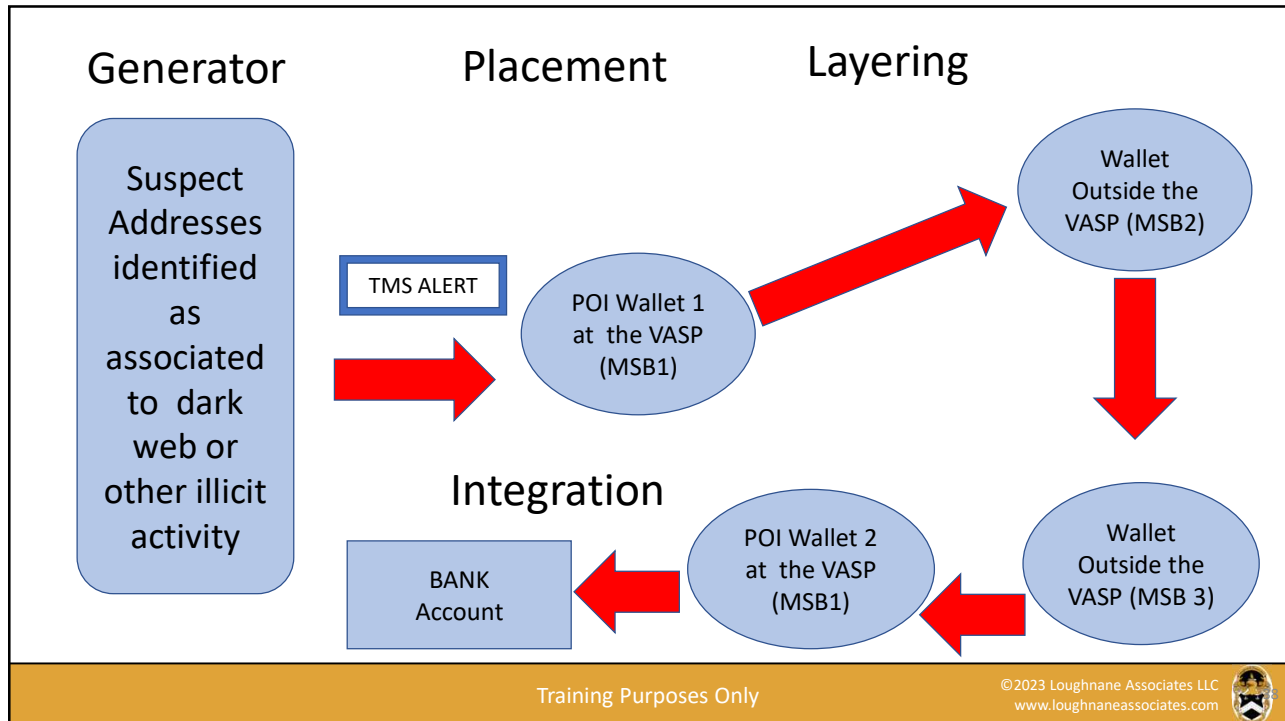
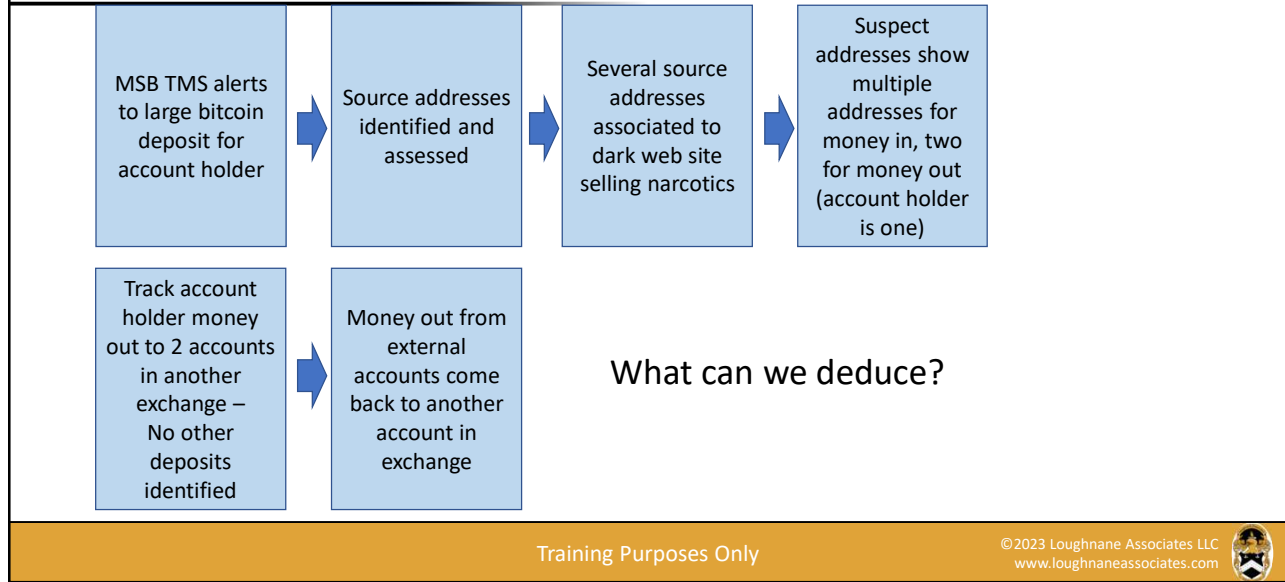
Intangible Property And
Non-Fungible Tokens

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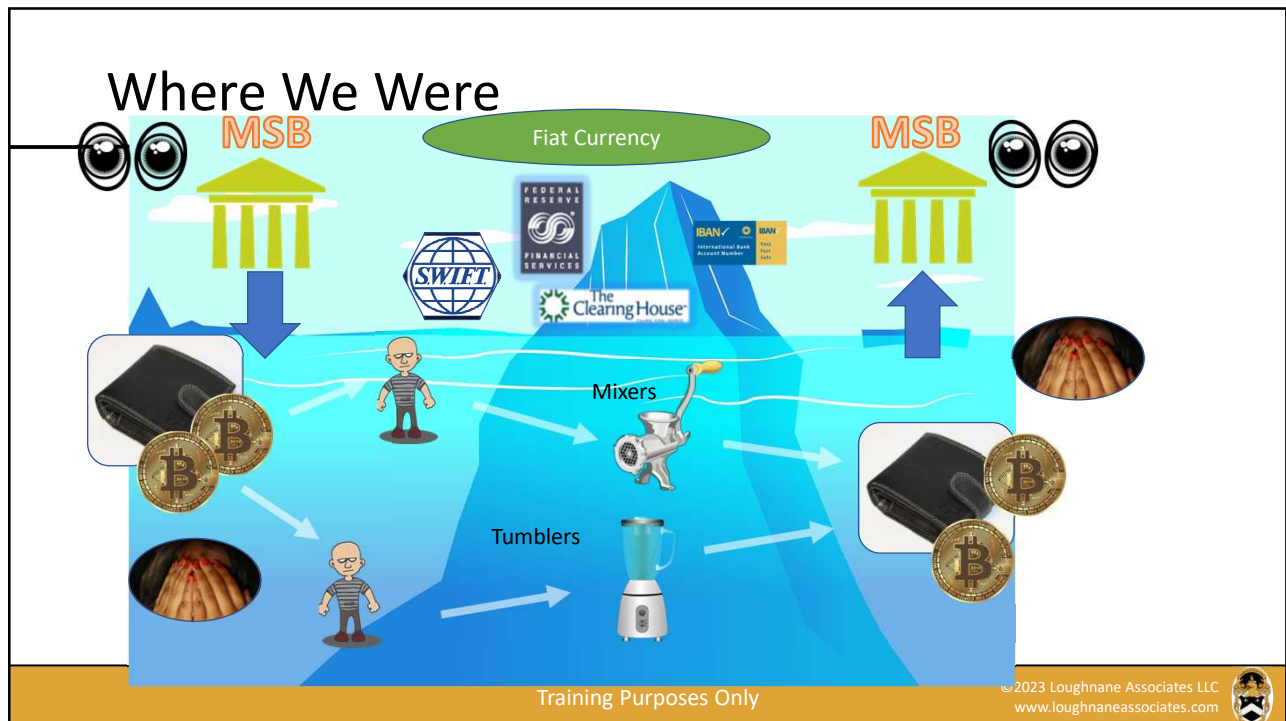
Crypto Money Laundering Scenario



Virtual Asset Service Providers

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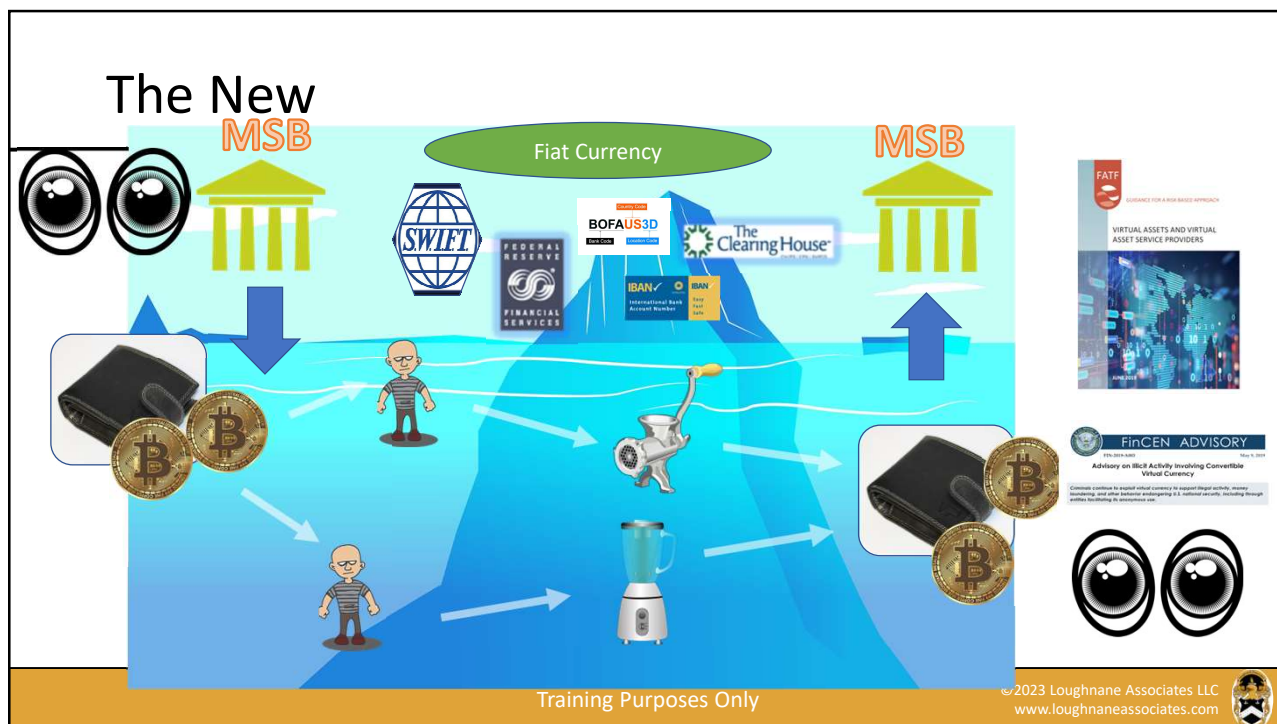
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“Virtual Assets” And “Virtual Asset Service Providers”

**Department of the Treasury
Financial Crimes Enforcement Network**

Guidance

FIN-2013-G001
Issued: March 18, 2013
Subject: Application of FinCEN’s Regulations to Persons Administering, Exchanging, or Using Virtual Currencies

FinCEN ADVISORY

FIN-2019-A003 May 9, 2019

Advisory on Illicit Activity Involving Convertible Virtual Currency

Criminals continue to exploit virtual currency to support illegal activity, money laundering, and other behavior endangering U.S. national security, including through entities facilitating its anonymous use.

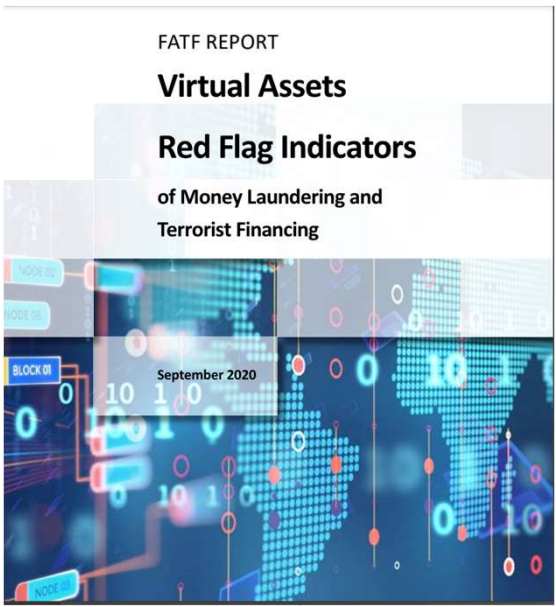
FATF
GUIDANCE FOR A RISK-BASED APPROACH

VIRTUAL ASSETS AND VIRTUAL ASSET SERVICE PROVIDERS

JUNE 2019

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FATF REPORT
Virtual Assets
Red Flag Indicators
of Money Laundering and
Terrorist Financing
September 2020

“Operational agencies including Financial Intelligence Units (FIUs), law enforcement authorities (LEAs), and prosecutors may find this report a useful reference for analysing suspicious transaction reports (STRs) or improving detection, investigation, and confiscation of VAs involved in misuse. “


...Notwithstanding, criminals did make use of VAs to evade financial sanctions and to raise funds to support terrorism.

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Type of Offenses (FATF)



FATF REPORT
Virtual Assets
Red Flag Indicators
of Money Laundering and
Terrorist Financing
September 2020

...Notwithstanding, criminals did make use of VAs to evade financial sanctions and to raise funds to support terrorism.

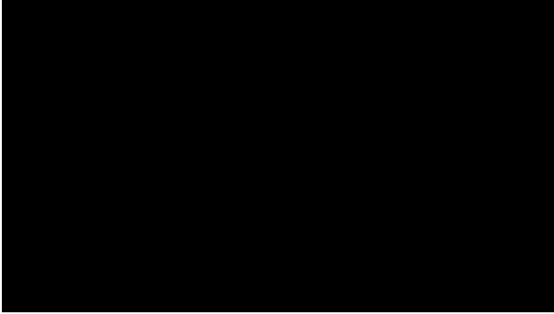
- Sale of Controlled Substances (most reported)
- Proliferation
- Fraud
- Tax Evasion
- Sactions and SDNs
- Child Exploitation
- Human Trafficking

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Common KYC Requirements



- Full name
- Date of birth
- Phone number and/or email address
- Physical address and/or country of residence
- Photo/scan of government-issued ID such as a driver's license or passport
- Copy of utility bill
- Photo of yourself with your ID

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FATF: Virtual Asset Service Providers

- Classified as Money Services Businesses
 - Remember the requirement for foreign registration
- FATF defines Virtual Asset Service Provider (VASP) as:
 - Any natural or legal person who is not covered elsewhere under the FATF Recommendations
 - As a business conducts one or more of the following activities or operations for or on behalf of another natural or legal person:
 - exchange between virtual assets and fiat currencies;
 - exchange between one or more forms of virtual assets;
 - transfer of virtual assets;
 - safekeeping and/or administration of virtual assets or instruments enabling control over virtual assets; and
 - participation in and provision of financial services related to an issuer's offer and/or sale of a virtual asset.



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Decentralized Exchanges (DEX)



TRADEOGRE Markets Help

● BTC Markets

Currency	Market	Change	Price	Volume	High	Low
Frane	BTC-FRAN	▲ 0.55%	0.00008289	22,234,470	0.00009130	0.00008153
Dera	BTC-DERA	▼ 1.41%	0.00027899	6,431,5784	0.00029738	0.00026983
Monero	BTC-MON	▼ 0.22%	0.00581579	5,114,70150	0.00610000	0.00554000
Ethereum	BTC-ETH	▲ 0.31%	0.06752344	2,028,10646	0.06890000	0.06611576
Litecoin	BTC-LTC	▼ 0.5%	0.00219533	1,496,32014	0.00234875	0.002054005
Ergo	BTC-ERG	▲ 18.25%	0.00016160	1,590,0104	0.00016600	0.00013761
Novem	BTC-NOV	▼ 4.34%	0.00009009	1,402,62863	0.00011187	0.00009900
PACTCoin	BTC-PACT	▼ 7.82%	0.00002268	1,486,78033	0.00002807	0.00002305
Ripple	BTC-RIP	▼ 1.27%	0.00001849	1,147,56463	0.00001897	0.00001815
Woinano	BTC-WON	▼ 0.96%	0.00000617	0,488,4137	0.00000632	0.00000599
Dogecoin	BTC-DOGE	▼ 1.29%	0.00000460	0,358,8775	0.00000480	0.00000444
Aeon	BTC-AEON	▼ 0.94%	0.00002217	0,338,0383	0.00002330	0.00002034
Zano	BTC-ZANO	▲ 8.84%	0.00005984	0,270,9470	0.00006256	0.00005496

© 2021 TradeOgre | Order: 1129 | BTC: 819,726.09 | LTC: 8144.22

TRADEOGRE Markets Help

Fee Schedule

TradeOgre currently implements a 0.2% trading fee on all fulfilled orders.
Withdrawal fees are dynamically calculated based on the specific coin technology, we strive to have minimal withdrawal fees.

Withdrawal Fees

ACM Accium	ADA Cardano	AION Aion	ARQ Arqma	ABBR ABBR	BBS BBScoin
BCN Bitcoin	BEAM Beam	BTC BitCash	BNC Bitcoin	BLOC BLOCmoney	BTC Bitcoin
BTCP Bitcoin Private	CASH Localbit	CCK CCKcoin	CVX Civitas	COAL BitCoal	CLT CLTcoin
D Decaus	DASH Dash	DERO Dero	DOGGE Dogecoin	ERG Ergo	ETH Ethereum
ETN Electroneum	ETNE Electroneo	ETREP Electroneo	FBI Fidelity	FLUX Flux	GHOST Ghost
GPX Gold Poker	GRFT GRFT	GRIM Grimm	GRN Grin	GLRC Grincoin	INC Incognito
INTU Intuition	IRD Indium	KRB Kuro	LNS Lins	LTC Litecoin	LTM Lethium

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PROS

- Simplest registration ever
- No KYC verification
- Low fees
- Neat trading interface
- Accepts worldwide customers

CONS

- No way of buying crypto with fiat
- No official support
- No way of marking favorite coins
- Ugly charts

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Perfect Money TM
Just perfect



English

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Fast, easy, comfortable way to develop your money

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Access to Perfect Money accounts from the United States is not allowed.

Services of Perfect Money are not available to US citizens or US residents. This includes US residents/citizens leaving overseas. In short, if you live in the USA, you are not eligible for Perfect Money services.

- In operation since 2007
- Says it is based in Panama, but the Panamanian government says no
- Once a user obtains an account, they can transfer Perfect Money units to other users inside the system
- Southern Methodist University 2011 study - Liberty Reserve and Perfect Money were two of the most widely accepted digital currencies for online Ponzi schemes
- Of 1,000 websites that linked to Perfect Money, they found 70% that were Ponzi schemes

All Account that belong to US Citizens/Residents/US Companies will be disabled within 15 days 15.06.13

Dear Customers,

In line with our policy, all accounts that belong to US Citizens/Residents/US Companies will be disabled on 1st of July. If you still have funds on your account, please take appropriate and timely steps to withdraw the balance. Please note that after 1st of July, no transactions can be executed at accounts that fall into the above mentioned category.

Please do not postpone taking action to withdraw you balance.

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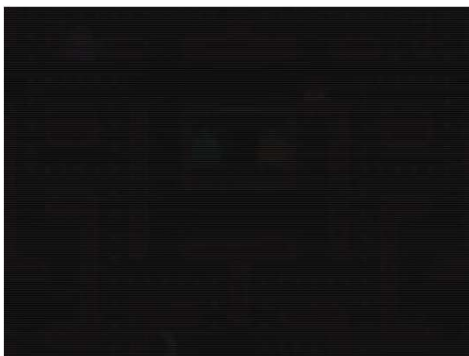
Non Fungible Tokens and MMOs

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“Intangible Property” No physical substance



- Intellectual property
- Non-fungible tokens (NFTs)
- Copyrights
- Trademarks
- Patents
- Virtual World Assets

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Non-Fungible Tokens

- NFTs are unique cryptographic tokens that exist on a blockchain and cannot be replicated.
- NFTs can be used to represent real-world items like artwork and real-estate.
- "Tokenizing" these real-world tangible assets allows them to be bought, sold, and traded more efficiently while reducing the probability of fraud.
- NFTs can also be used to represent peoples' identities, property rights, and more.



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Larva Labs
Projects Writing About

CryptoPunks Overview

Punks for Sale

Transaction History

CryptoPunks / 3621

CryptoPunk 3621
One of 3840 Female punks.

Accessories

- Mohawk**: 441 punks have this.
- Earring**: 2459 punks have this.
- Cigarette**: 961 punks have this.

Current Market Status

This punk is currently owned by address **0xf4a775**.
This punk is currently for sale by owner for 20E (\$38,123).
There are currently no bids on this punk.

Transaction History

Type	From	To	Amount	Txn
Offered			20E (\$33,764)	Mar 28, 2021
Offer Withdrawn				Mar 12, 2021
Offered			25E (\$44,471)	Mar 11, 2021
Offered			20E (\$36,995)	Mar 10, 2021
Sold	0xb6be4d	0xf4a775	0.09E (\$42)	Dec 03, 2017
Offered			0.09E (\$26)	Nov 01, 2017
Claimed		0xb6be4d		Jun 23, 2017

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Non-Fungible Token

- Cryptographic assets on blockchain **with unique identification codes and metadata that distinguish them** from each other
- Unlike cryptocurrencies, they cannot be traded or exchanged at equivalency. This differs from fungible tokens like cryptocurrencies, which are identical to each other and, therefore, can be used as a medium for commercial transactions. They can be traded or exchanged, one for another.
- For example, one Bitcoin is fungible because it is always equal in value to another Bitcoin
- Made unique and irreplaceable, thereby making it impossible for one non-fungible token to be equal to another

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Non-Fungible Token

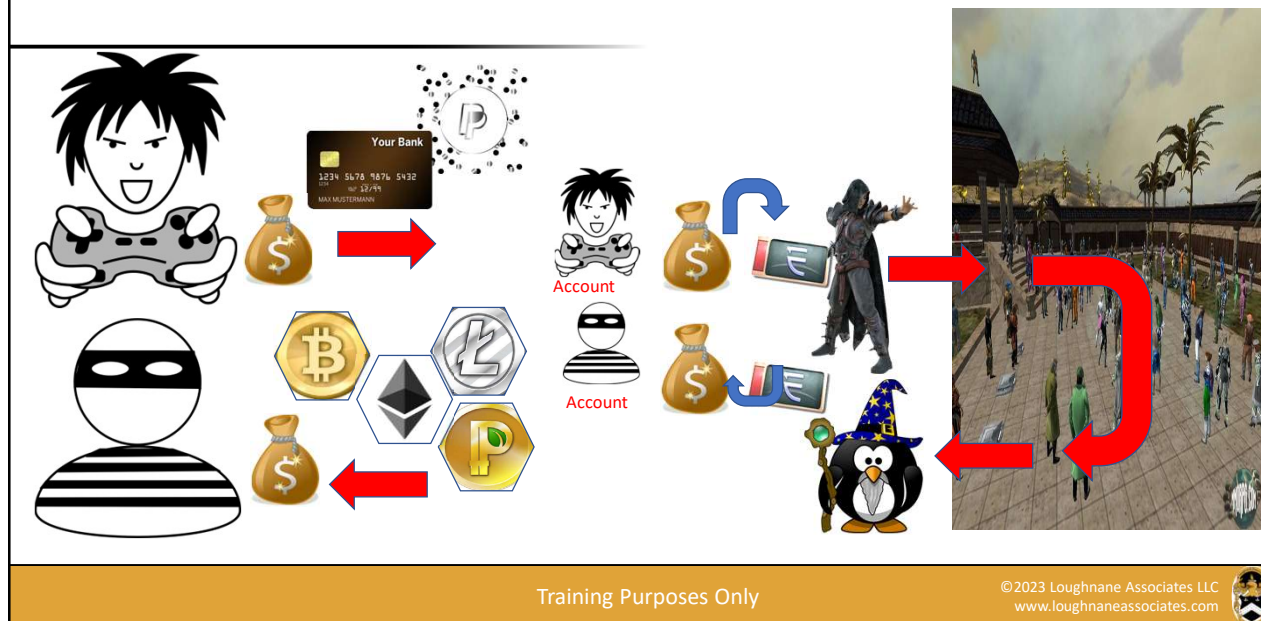
- They are digital representations of assets and have been likened to digital passports because each token contains a unique, non-transferable identity to distinguish it from other tokens
- Just like Bitcoin, NFTs also contain ownership details for easy identification and transfer between token holders
- Owners can also add metadata or attributes pertaining to the asset in NFTs. For example, tokens representing coffee beans can be classified as fair trade. Or, artists can sign their digital artwork with their own signature in the metadata

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Massively multiplayer online game value transfers



“Gold Farming”

- The practice of playing a massively multiplayer online game (MMO) to acquire in-game currency, later selling it for real-world money
- Player wishing to save many hours of playing time, are willing to pay substantial sums to gold farmers



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Questions?

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Value Touches Everything

