Introduction to Virtual Assets

High level overview

- **Natively digital** – Same as money transferred via traditional payment methods e.g. SWIFT.
- **Peer to peer** – Network sustained by participants, not a central third party.*
- **Blockchain** – The statement/ledger of all transactions
- **Addresses** – Used to transact, similar to account numbers
- **Wallets** – User controlled software which generates and stores addresses
- **Transaction identifiers** – Each transaction gets a unique identifier
- **Inputs and outputs** - Input are assets being spent and outputs are those created from the inputs.
- **Mining/Consensus** – The means of minting new coins and adding new transactions to the blockchain.
- **Transparent** – Many blockchains are easily auditable and so it is possible to attribute transaction activity to an address.
- **One or multiple** - Some cryptocurrencies use one address for all transactions activity, some use multiple.

Consensus

- For Blockchain-based distributed systems:
  - enables a unified agreement
  - aligns economic or other incentives
  - insures fairness
  - enables fault-tolerance
  - ensures that everyone works on the same state of the world
- Proof of Work; Expending costly resources
- Proof of Stake; Commitment of value
- Consortium: Set number of known/validated verifiers
- This is an evolving subject so don’t get too hung up on this aspect

Jargon: There is a lot of this!

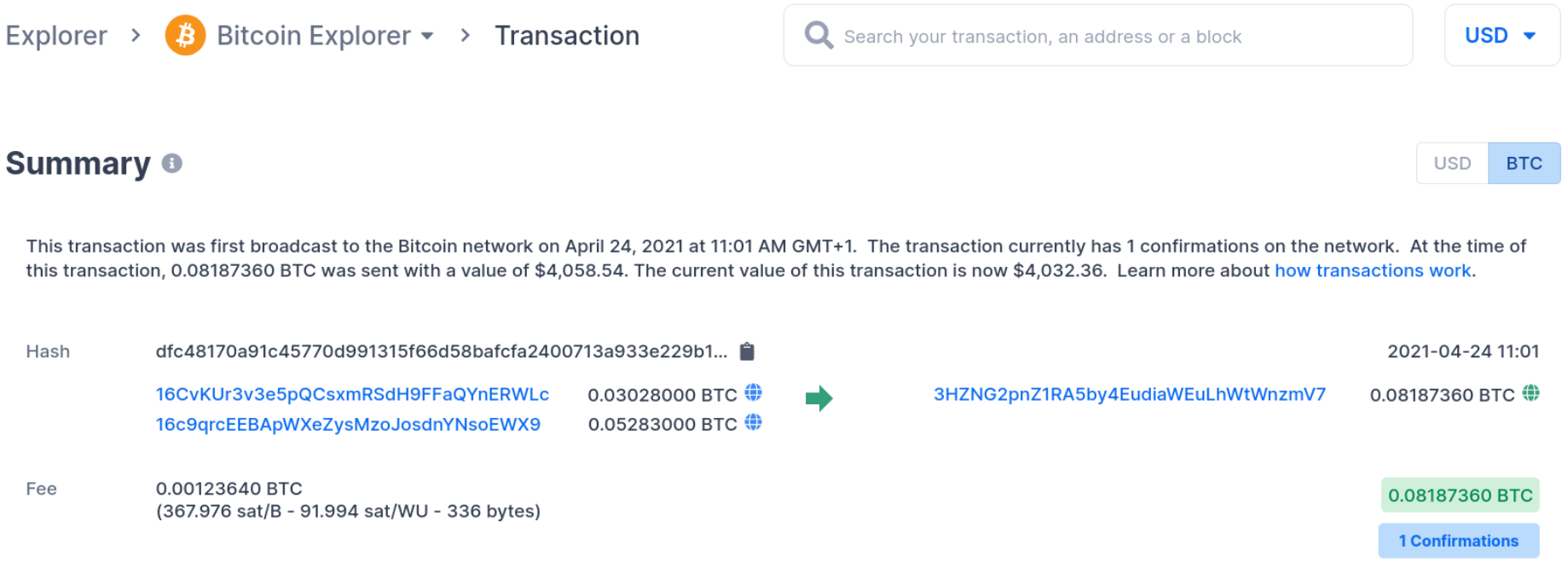
Crypto asset	**Cryptocurrency/ Cryptocurrencies**	**Token**	**Stablecoin**
Custodial/Non custodial	**VC: Virtual currency**	**NFT: Non fungible token**	**VA: Virtual asset**
VASP: Virtual Asset Service Provider	**CBDC: Central Bank Digital Currencies**	**DEX: Decentralised Exchange**	**DeFi: Decentralised Finance**
	DAO: Decentralised Autonomous Organisation	**Dapp: Decentralised application**	

Use cases

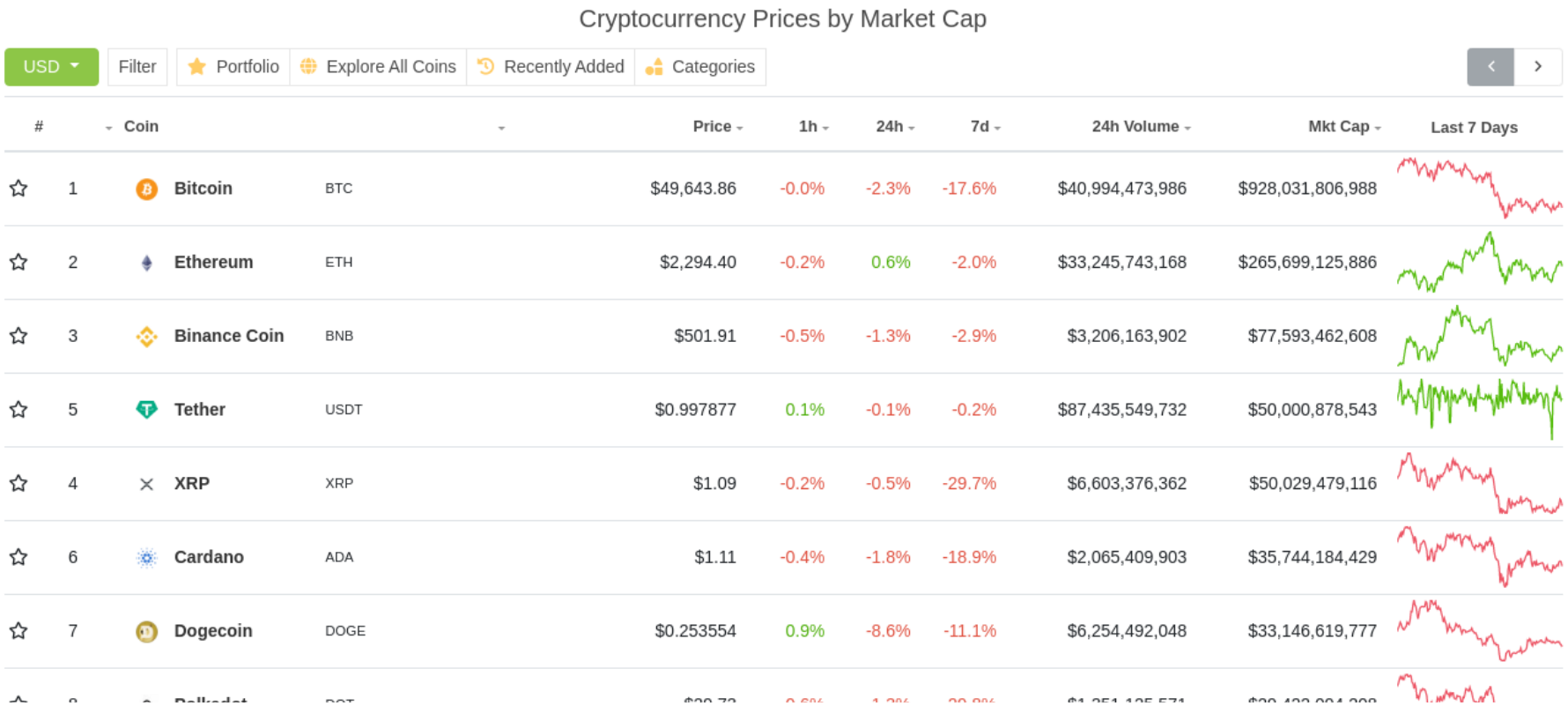
- Digital cash
- Store of value
- Financial markets
- Music
- Digital ownership
- Communication
- Identity
- Governance/legal
- Gaming
- Storage
- Supply chains
- Hospitality
- Energy
- Health

Practical 1

Wallet	Install Bluewallet from Google Play or the Apple App Store
Mnemonic	Click on “Add Wallet” and select “Bitcoin”. The mnemonic representing the “private key” is now displayed. This needs to be written down. Once done click on “Ok I wrote it down”
Receiving	Click on the blue box titled “Wallet” which displays “0 BTC”. Now select “Receive” and click “Yes I have”.
Address	The QR code is a representation of the address (account number) and underneath the address is written out (alpha numeric starting “bc1q”)
HD wallet	Click back and then select the options/settings menu within the wallet. Click on Show addresses, review both “Receive” and “Change” headings. Explore the options within the app. Try turning on “Advanced mode” in settings (come out to the main screen and it’s under “General”). Create a new wallet and select “Segwit, what is different about the address?
Questions	Consider this process and confer in your breakout groups on what questions it raises. Choose the most poignant one for sharing with the rest of the participants



Anatomy of a Bitcoin transaction



What about the rest?

Ethereum: Key points

1. Ethereum utilise “accounts” as opposed to a UTXO model. This means one address can be used to complete all transactions. There is no separate change address or need to create a new address for every receipt.

2. Tokens created on the Ethereum protocol are not stored by holders in separate address types. They are credited to an Ethereum address.

3. Transaction fees are calculated using an element called “Gas”. The native Ethereum asset (ETH) is used to pay for fees.

4. It is possible to utilise the transparent nature of many smart contracts to follow the route an asset has taken.

5. The more complex the execution of the transaction, the more Gas it consumes. This equates to higher fees being paid.

6. ETH on it’s own is not seen as a significant asset utilised by criminals.

7. It is however the main platform for stablecoins which have seen extensive use in money laundering. In particular the asset Tether (USDT) has been prominent.

8. The ability to utilise cryptocurrency as a money laundering tool is strengthened by USDT’s stable value (pegged to a dollar). This allows for deals to be struck and payments made via other channels (bank transfers etc.) without volatility affecting the terms of the agreement.

Transaction Details

Buy Exchange Earn Gaming

Overview | Internal Txns | Logs (5) | State | Comments

Transaction Hash:	0x042b7053bab1e80e5761adab3b223c3c576ff4e2a93c392d46cc5715308acefd
Status:	Success
Block:	12290049 4 Block Confirmations
Timestamp:	53 secs ago (Apr-22-2021 12:38:28 PM +UTC) | Confirmed within 12 secs
From:	0xd7f8157fc629584c2b3c6f7291de1a373b045676
To:	Contract 0x7a250d5630b4cf539739df2c5dacb4c659f2488d (Uniswap V2: Router 2) └ TRANSFER 0.11 Ether From Uniswap V2: Rout... To ➞ Wrapped Et...
Transaction Action:	Swap 0.11 Ether For 189,675,405.387924102848950964 SHIB On Uniswap
Tokens Transferred: 2	From Uniswap V2: Rout... To Uniswap V2: SHIB 4 For 0.11 ($284.71) Wrapped Ethe... (WETH) From Uniswap V2: SHIB 4 To 0xd7f8157fc62958... For 189,675,405.387924102848950964 ($286.41) SHIBA INU (SHIB)
Value:	0.11 Ether ($284.20)
Transaction Fee:	0.0099856944 Ether ($25.80)
Gas Price:	0.0000001089 Ether (108.9 Gwei)

Click to see More

Private Note: To access the Private Note feature, you must be Logged In

Money Laundering

- Professional money laundering facilitators/controllers/networks are increasingly taken advantage of cryptocurrencies.
- They will use whatever cryptocurrency/virtual asset protocol that suits their purpose. An example is the transition to protocols with lower fees (ETH to TRON).
- Stablecoins in particular are attractive to these networks. They remove the volatility aspect of floating assets whilst still enabling fast international payments which do not touch traditional financial networks. This make negotiations and conversions to cash values much easier to navigate.
- Importantly cryptocurrencies are not becoming the asset desired as the end product. Clean cash or bank transfers are still the most desirable financial mechanisms. As such cryptocurrencies have just become another weapon in the money laundering arsenal.

Money laundering cont.

- One particular tactic identified in a number of instances has been the formation of digital payment companies. These are incorporated are seen as a vehicle to facilitate OTC accounts with mainstream, highly liquid cryptocurrency exchanges. Money laundering activity is then hidden as trading activity with professional enablers assisting in falsifying AML/KYC checks.
- It has also become very apparent that organised crime groups are seeking out entities who can facilitate money laundering involving cryptocurrencies. As a result, professional networks are servicing multiple OCG's within one or more jurisdictions. International corruption cases are also seeing these networks as key aspects of money laundering processes.
- The same tactics are still used e.g. IVTS, using willing/unwilling money mules on an international scale, multiple types of accounts across many financial services, high volumes of intermediary transactions, moving from one currency to another, using shell/front companies, and combining multiple crime types e.g. MTIC fraud with traditional crime types with money laundering as a service.

Money laundering cont.

Cryptocurrency protocols/network do offer some unique opportunities for money laundering:

Non-Fungible Tokens (NFT's) – These tokens are cryptographic proof of ownership for real world or digital items. They act in a similar fashion as bearer bonds; control of the private key is defacto proof of ownership. The current focus for NFT's is art and gaming items. Recent sales at auction houses such Sotheby's have seen NFT's go for millions of dollars. Beyond the current focus there is a drive to increase the adoption of NFT's across a broad spectrum of industries e.g. act as festival tickets, proof of identity, access to platform, etc.
With a liquid market for such items and many tools to facilitate such activity it would seem a matter of time before criminal exploitation is a factor. An example of this could be money laundering entities arranging a series of consecutive sales and purchases for an NFT. This can also be used to manipulate the price of NFT's.

Cryptocurrency specific shell/front entities - DeFi projects have used alternative funding models to bypass the controversial ICO structures of 2017 (e.g. entities must provide a service to the project in reward for tokens). This has, to date, allowed these projects to skirt regulation and scrutiny. It is already suspected that sophisticated criminal actors have utilised DeFi to launch projects which have rigged the issuance of tokens and taken in significant amounts of criminal proceeds.
Such vehicles for money laundering offer several advantages, for example the entities behind the project can use aliases/pseudonyms as in the project will not have a business entity registered. This is because a smart contract will be used to control the platform and the term "decentralised" will be used to claim it is not run by any one entity, but the community holding "governance" tokens.

Private sector input

"*Fraud is the dominant cryptocurrency crime*": Fake investment platforms, romance fraud, compromising accounts, exit scams, corruption.

Compromise of DeFi smart contracts is the most significant contributor to financial losses. The money laundering which takes place after this involves moving between different assets through DEX's and attempting to chain swap where possible. This is why reporting on the matter has highlighted the rise in illicit finances being moved through DEX protocols.

The transparency of most platforms and the centralisation of many projects has led to offenders having significant issues in laundering funds. There have even been instances where the offender has returned all the funds after negotiating a "finders fee"!

Corporate investigation entities are also reporting that a rising number of instances involving cryptocurrency assets.

Terrorist financing is still largely based in legacy financial systems however there have been more instances of reports highlighting the use of cryptocurrency:

"In addition to bitcoin and Ethereum, the seizure order demonstrates that Hamas also collected donations in Tether, TRON, Cardano, XRP, and DOGE, indicating their attempts to break out from reliance on bitcoin after the US DoJ announced the seizure of $2 million in cryptocurrency from prominent terrorist groups."

Cryptocurrency focused malware

Type	Description	Example
Info stealers	Collect saved credentials, files, autocomplete history, and cryptocurrency wallets from compromised computers.	Redline
Clippers	Can insert new text into the victim's clipboard, replacing text the user has copied. Hackers can use clippers to replace cryptocurrency addresses copied into the clipboard with their own, allowing them to reroute planned transactions to their own wallets.	HackBoss
Cryptojackers	Makes unauthorized use of victim device's computing power to mine cryptocurrency.	Glupteba
Trojans	Virus that looks like a legitimate program but infiltrates victim's computer to disrupt operations, steal, or cause other types of harm.	Mekotio banking trojan

Courtesy of Chainalysis research

Difficulties

- Challenge for law enforcement is that criminality will dynamically exploit the various use cases.
- An example is the energy sector. Increased focus on green energy and recycling has opened up numerous avenues for money laundering.
- There is too much for active investigators to manage in relation to this subject.
- Effective strategies need to be implemented throughout the relevant LEA. These need to consider resources, training, horizon scanning and remits.
- To achieve this getting buy in from senior management is vital.

The End!
Any questions?