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Tracing with TRM: Advanced Techniques

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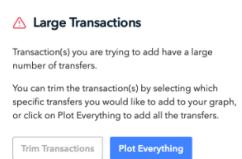
We've updated our Exposure user interface in Graph Visualizer. See [here](#) for more information. Updates to all Exposure articles are forthcoming.

Processing Complex Datasets and Large Transactions in Your Investigation

Throughout the course of an investigation, you may come across complex datasets that are difficult to make sense of clearly. This might include large transactions, with many inputs and/or outputs, or complicated spreadsheets of data from a VASP. In these cases, it's important to be able to identify the right transfers to trace, to avoid creating noise in your investigation or following leads that may be irrelevant. In this tutorial, we'll go over the types of complex data you may encounter, and tips for identifying the right inputs/outputs for your investigation.

Tracing Large Transactions

If you try to plot a transaction that has more than 25 inputs and/or outputs, you'll see a popup warning you that it is a large transaction. You can then choose to plot everything, or you can trim to just the transfers that are relevant to your investigation. Let's talk about why large transactions may appear.



Why Transactions May Have Multiple Inputs or Outputs

Multiple Inputs

With the exception of special "Coinjoin" transactions, all inputs to a UTXO transaction are typically controlled by the same entity or individual. Therefore, having all of those inputs on the graph can make unnecessary noise and complicate the story you are trying to tell. You may choose to only plot one of the inputs to make a simpler graph, or you may be only interested in a specific flow of funds, so only select a particular input.

Multiple Outputs

More common, however, is trimming a large number of outputs both for UTXO and account based transactions. You may encounter multiple outputs in a transaction when it is a withdrawal from a service, such as a Virtual Asset Service Provider (VASP). Batched withdrawals are a transaction pattern common with VASPs, in which a VASP consolidates multiple payments into a single transaction with many outputs to save on transaction fees. Other examples include a mixer distributing coins to multiple participants, or perhaps the output of bridge where newly minted coins are sent to a variety of users from the genesis address.

Identifying Outputs in Batched Withdrawals

Batched withdrawals from a VASP are the most common reason you will encounter a large transaction in TRM. In a batched withdrawal, most of the outputs are unrelated to your case, and instead relate to other VASP customer withdrawals. These should not be added to your graph, without a specific reason to do so. In most investigations, you'll likely already know your target output address, whether from your victim or other evidence. In these cases, you can search the output list for the address in question by clicking the filter button in the Output Address column. Alternatively, if you're investigating a specific type of activity, you can filter by the category type.

Inputs	Address	Name	Category	Amount	Amount USD	Label
<input type="checkbox"/>	1H9Lc...lch	Binance (Binance.com)	Exchange - Fiat	0.21290022	\$21.00	-
<input type="checkbox"/>	1H9Lc...lch	Binance (Binance.com)	Exchange - Fiat	0.10119418	\$10.00	-
<input type="checkbox"/>	1H9Lc...lch	Binance (Binance.com)	Exchange - Fiat	20.1195624	\$196.00	-

Outputs	Address	Name	Category	Amount	Amount USD	Label
<input type="checkbox"/>	1D9n...9t		ATM	0.0011007	\$0.00	-
<input checked="" type="checkbox"/>	1D9n...9t		Other	0.0004997	\$0.00	-
<input type="checkbox"/>	1D9n...9t		Shop AKA	0.0004997	\$0.00	-
<input type="checkbox"/>	1D9n...9t		Other	0.000170	\$0.00	-
<input type="checkbox"/>	1D9n...9t		Shop AKA	0.000170	\$0.00	-

Back Add Selections

Another situation where you may encounter batched withdrawals is plotting transaction hashes from a subpoena response or other legal process from a VASP. In the case of a subpoena return, VASPs will usually give you a spreadsheet with several tabs of information, including the output address, transaction hash, and amount. You'll want to plot only the transactions to the indicated address(es), not all transactions.

When you've identified the relevant transactions, whether through searching for categories, known addresses, or addresses and amounts presented to you from a subpoena return, you can check the box next to the transaction(s) and then add them to your graph.

Outputs 100

Address	Name	Category	Amount	Amount USD
1EKrfi...Z222	Shop XXX	Child Sexual Abuse M	0.008	\$78

Mixing is another case where you may see large transactions. Tracing through mixers is very complex; we recommend reaching out to TRM for support if you encounter mixers in your investigations. TRM may be able to provide potential output candidates which relate to your case; these can then be used to trim a large mixing transaction.

Try It

Search for and plot the following transaction hash:

76353654efe121669a61edfcb99c4380fa6169939a4f2a060be0698e51c204ad

You will see the "Large Transactions" warning appear. Click to Trim Transactions. First, observe the inputs: you should see three inputs, all from a single address. Because these are all from the same address, you can plot all inputs and they will appear as a single node.

Next, look at the Outputs. Search for 1EKrfiWZoAbz17DWJxUrycQKg3Fo4zZ2Z, an address that we came across during our investigation, and check the box to add this to your graph.

Twin Transactions							
Please select the specific transfers you want to add to your graph.							
 7635365...204ac	 7635365...204ac					May 4, 2018 2:12 AM	
4 Selected							
Inputs	 Address	 Name	 Category	 Amount	 Amount USD	 Label	
	 NPGWJ...jeu	Source (Binance.com)	Exchange	Huobi	\$2,672,982.02	\$15,458	-
	 NPGWJ...jeu	Source (Binance.com)	Exchange	Huobi	15,013,625.04	\$165,513	-
	 NPGWJ...jeu	Source (Binance.com)	Exchange	Huobi	20,349,054.02	\$1,181,111	-
Outputs	 Address	 Name	 Category	 Amount	 Amount USD	 Label	
	 1084...2222	Shop XXX	Child General Account	N	0.056	\$0	-
							1 Sale
Back							Add Transaction

Click "Add Transactions." Your graph should now look like the graph below.



Bulk Data Analysis

Getting a subpoena return from a VASP is a big step in an investigation, but the response can be quite complex and lengthy. Typically, the information provided to you relates solely to your suspect's activity at that particular VASP. This allows you to confidently trace the deposits, withdrawals and internal activity of your suspect within the VASP. The downside of this wonderful result is the sheer amount of information which you may be provided. You will likely receive transaction information, addresses, transaction values, exchange rates, and timestamps, along with PII user information like IP addresses, device login information, and KYC details. Carving through this data is a lengthy and time consuming process. This is where Bulk Data Analysis can help you save time and increase your efficacy by simply and effectively tracing relevant transaction data.

TRM makes it easy to process the kind of data you might get back from a VASP using our Bulk Data Analysis tool. With Bulk Data Analysis, you can upload a CSV with the responses from the VASP, and TRM will automatically ingest and plot those transactions.

Using Bulk Data Analysis

To use Bulk Data Analysis, click on the menu button and open Bulk Data Analysis. Select the type of data you want to analyze using the list on the left side - you can choose between account record ingestion, transaction hashes or IDs, or IP addresses.

Bulk Data Analysis

Type of Data

Account Record Ingestion

Transactions

IPs

Easy review account/statement activity by plotting sets of deposit and withdrawal transfers on a graph ([CSV format](#))

Paste records here in CSV or TSV format using the template above

The file you receive from a VASP may not exactly match the format that TRM ingests, so you'll likely need to do some manipulation of the file before you can copy and paste the data into the Bulk Data Analysis tool. Below, see an example of the kind of data you might get back.

In the Account Record Ingestion tool, click on the "CSV format" link to download a sample template, and then copy your data into that format to ensure that TRM can ingest your data.

Once your data is in the right format, you can copy and paste into the box, and then add it to your document.

Bulk Data Analysis

Account Record Ingestion

Transactions

IPs

18m1U954f0cf...Deposit BTC - BTC
0x1c170ad83091a4a14454a5d1fc1e17a2b802558f250a097bcb9a0vP03a308d
0x4d1679a10271c1a4a04903742d1e78a4f9991c94 - Withdrawal BSC - BSC
0x1ab0a0beedee7f58c2815a7398100a51aead2cf9594c25501256128026064e
0x9b1454de1b575768748a55330091fa5570a7b Deposit ETH - ETH
0x1ba07499001ee221b21a7e93784494e9770944eb7b98c0b7f7d763bedBca
0x4b49e9e1027bc1a4c0d4907342de78a4d999b9cb4 - Deposit BSC - Binance Smart Chain

Detected 10 transactions.

Processing Transaction Data

If the data you receive is incomplete or otherwise incompatible with the Account Record Ingestion format, you may be able to use the Transactions upload within Bulk Data Analysis to have TRM automatically provide the missing data. This commonly occurs when your VASP return does not provide a destination address for deposits. In this case, click on Transactions in the Bulk Data Analysis tool. Then, click the download button in the upper right to download the CSV template for transactions.

Type of Data

Account Record Ingestion

Transactions

IPs

Add multiple transactions to analyze sending and receiving addresses

Copy/paste a formatted CSV or TSV file following the sample above, or enter multiple transaction hashes (also referred to as TXIDs or Transaction IDs)

You'll need to provide the transaction hash and blockchain, with direction and destination address as optional fields. It should look like the spreadsheet below.

	A	B	C	D	
1					
2	Txn Hash		Blockchain	Direction	Destination Address
3	183e4ff0b237719fa121d2991037840a489d5d99116cf2f203959ad694	BTC	Deposit		
4	1fb2bd343aefc2a2c121a1a2e083ca5a874410de098330c68129042e75d9d8	BTC	Deposit		
5	0x1ab0a0beedee7f58c2815a7398100a51aead2cf9594c25501256128026064e	ETH	Deposit		
6	0x1ba07499001ee221b21a7e93784494e9770944eb7b98c0b7f7d763bedBca	BSC	Deposit		
7	16b2fc75d86eb0936a63715374c04966a2693846ebbed678cf52a5670c42	BTC	Deposit		

Once your data is formatted correctly, copy and paste the data in the Transactions box and click Next to process the data. TRM will process this data, giving you an opportunity to select direction and update other fields as necessary.

Bulk Data Analysis

Type of Data

Account Record Ingestion

Transactions

IPs

Analyze 5 Transactions

Blockchain Txn Hash Direction Destination Address

BTC 18a4ff0b237719fa121d29 Deposit

ETH 1fb2bd343aefc2a2c121a1a2e083ca5a874410de098330c68129042e75d9d8 Deposit

ETH 0x1ab0a0beedee7f58c2815a7398100a51aead2cf9594c25501256128026064e Deposit

BSC 0x1ba07499001ee221b21a7e93784494e9770944eb7b98c0b7f7d763bedBca Deposit

BTC 16b2fc75d86eb0936a63715374c04966a2693846ebbed678cf52a5670c42 Deposit

Once you're happy, click "Analyze and Export CSV." The resulting data can be verbose, and will look like the spreadsheet below. From here, you'll need to sort through the resulting data and locate the missing output addresses from your initial VASP return. As a suggestion, you can use the transaction amounts to match the return to the data provided by TRM. In the example below, we've bolded the addresses that we were missing.

Blockchain	Transaction Hash	Timestamp	Address	Sender or Entity Name	Entity category	Amount	USD Value
Blockchain	183e4ff0b237719fa121d2991037840a489d5d99116cf2f203959ad694	2022-07-17T22:22:02Z	0x227a171b13c0797a7093008fb7a0c	Binance (Blockchain)	Blockchain	0.02 BTC	202.950750
Blockchain	183e4ff0b237719fa121d2991037840a489d5d99116cf2f203959ad694	2022-07-17T22:22:02Z	0x4d1679a10271c1a4a04903742d1e78a4f9991c94	Binance (Blockchain)	Blockchain	0.02 BTC	202.950750
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Blockchain	183e4ff0b237719fa121d2991037840a489d5d99116cf2f203959ad694	2022-07-17T22:22:02Z	0x4d1679a10271c1a4a04903742d1e78a4f9991c94	Binance (Blockchain)	Blockchain	0.02 BTC	202.950750
Blockchain	183e4ff0b237719fa121d2991037840a489d5d99116cf2f203959ad694	2022-07-17T22:22:02Z	0x4d1679a10271c1a4a04903742d1e78a4f9991c94	Binance (Blockchain)	Blockchain	0.02 BTC	202.950750
Blockchain	183e4ff0b237719fa121d2991037840a489d5d99116cf2f203959ad694	2022-07-17T22:22:02Z	0x4d1679a10271c1a4a04903742d1e78a4f9991c94	Binance (Blockchain)	Blockchain	0.02 BTC	202.950750
Blockchain	183e4ff0b237719fa121						



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