



Blockchain

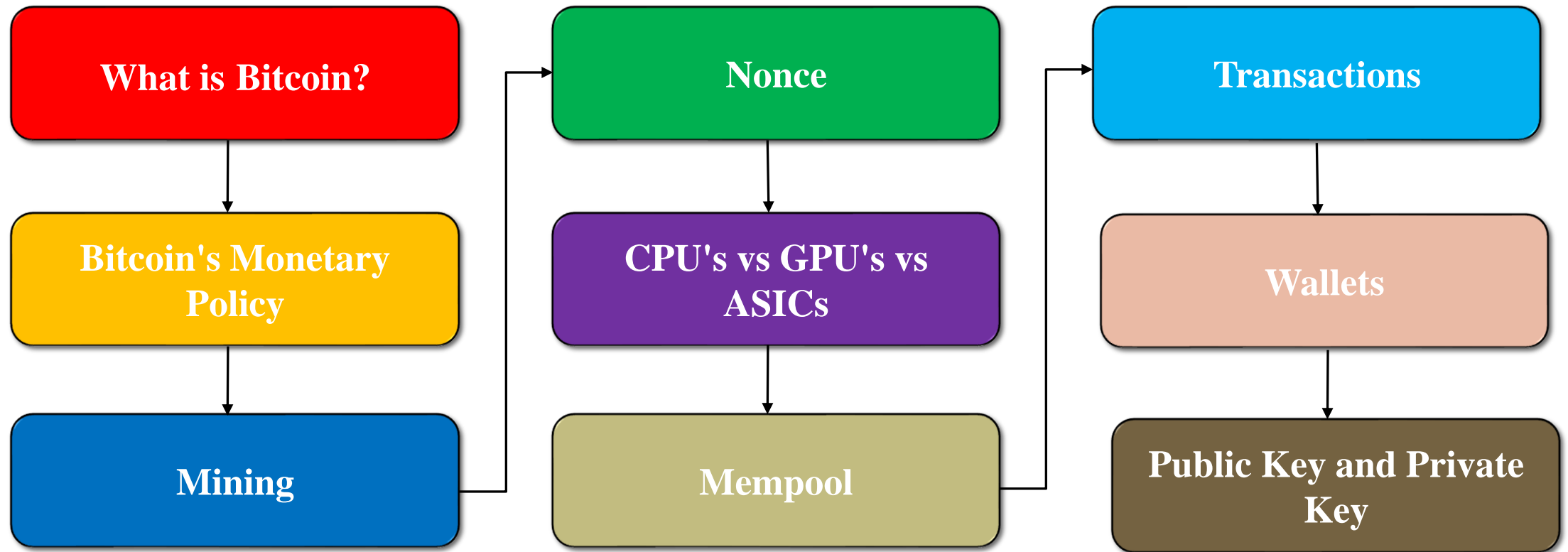
Dr. Bahar Ali

Assistant Professor (CS), National University Of Computer and Emerging Sciences,
Peshawar.



Cryptocurrency

Contents – Module B



An abstract graphic on the left side of the slide. It features a dark blue background with a grid of lighter blue squares. Overlaid on this is a large, circular, multi-layered structure. The outermost ring contains binary code (0s and 1s) in a light blue color. Inside this are several concentric rings of varying shades of blue, some with dashed lines and others with solid lines. The overall effect is a sense of depth and complexity, reminiscent of a stylized eye or a futuristic interface element.

How mempool works?

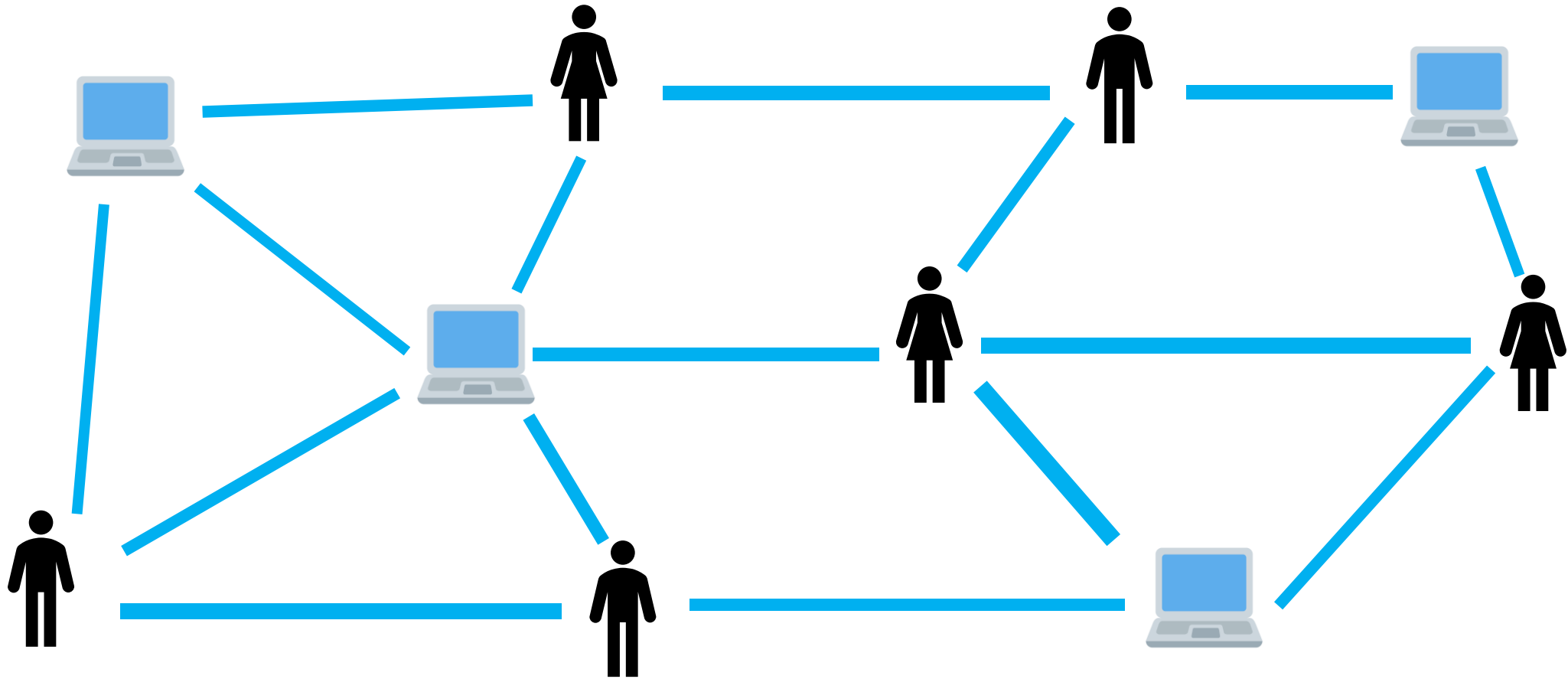
How does a Mempool work?

- Mempool is a place where all unconfirmed transactions saved
- Mempool is distributed, thus every node has its own Mempool
- When transactions are done, they are saved into a Mempool across the network
- Miner adds some transactions to a block and mines it, the information is sent to other nodes, the block is verified, and the transactions are removed from the pool

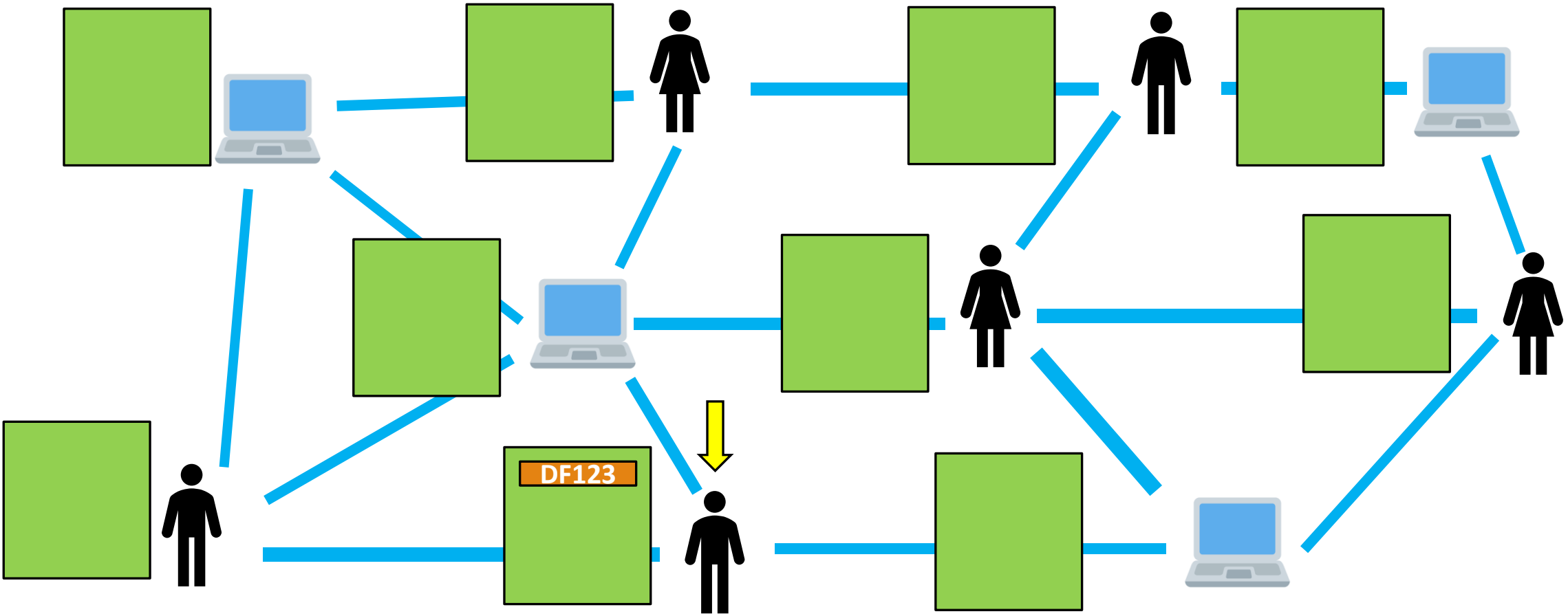
Demonstration of Unconfirmed transactions

<https://www.blockchain.com/btc/unconfirmed-transactions>

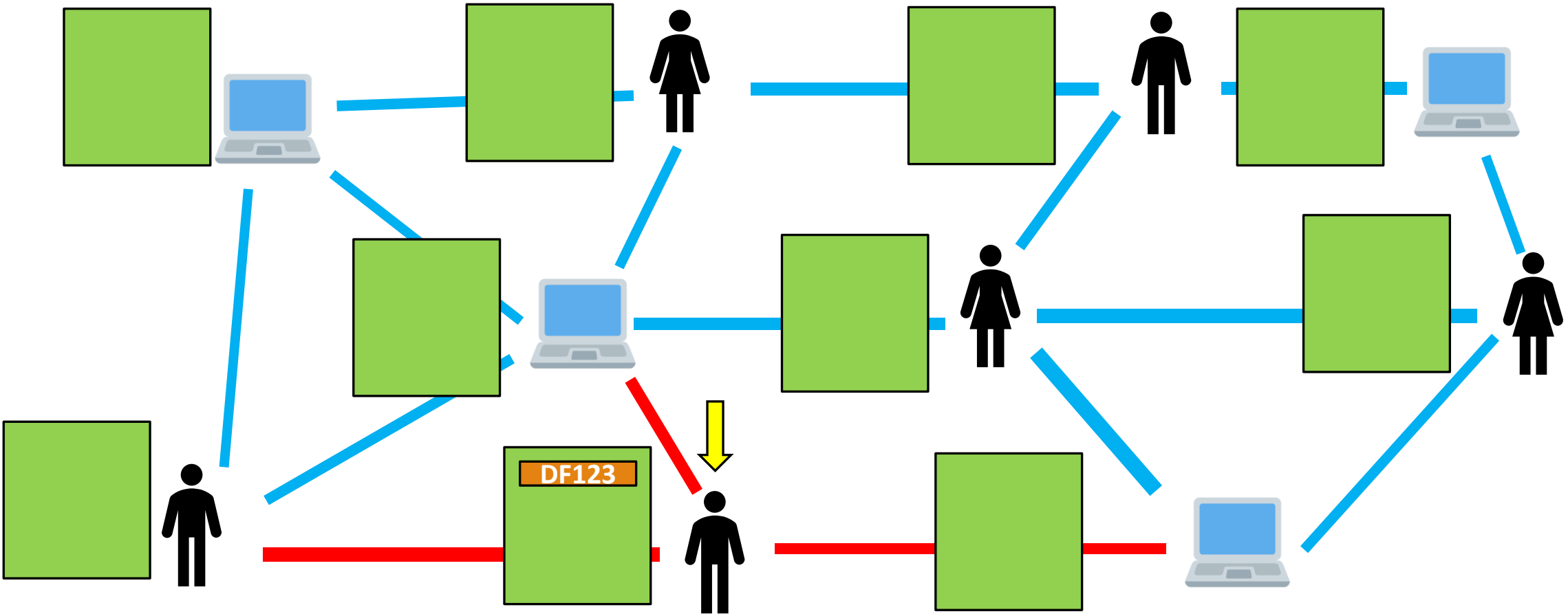
How does a Mempool work? (Behind the scenes)



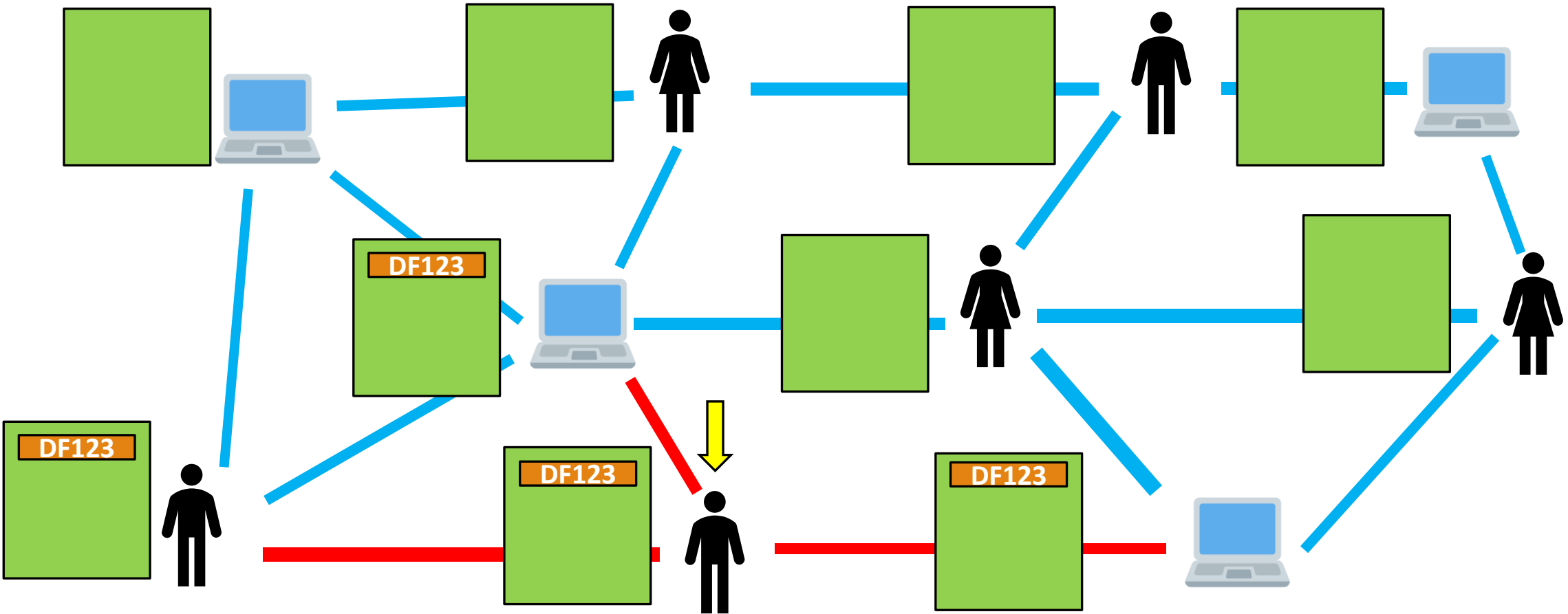
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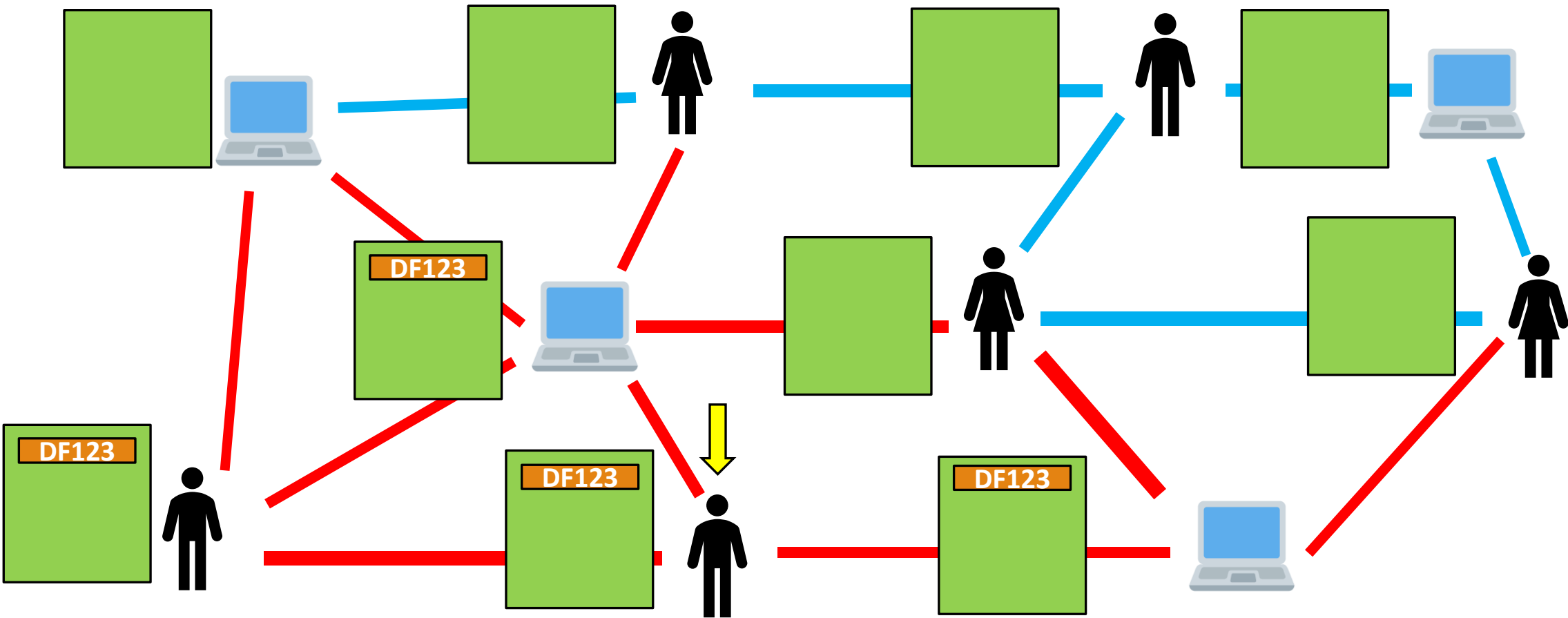
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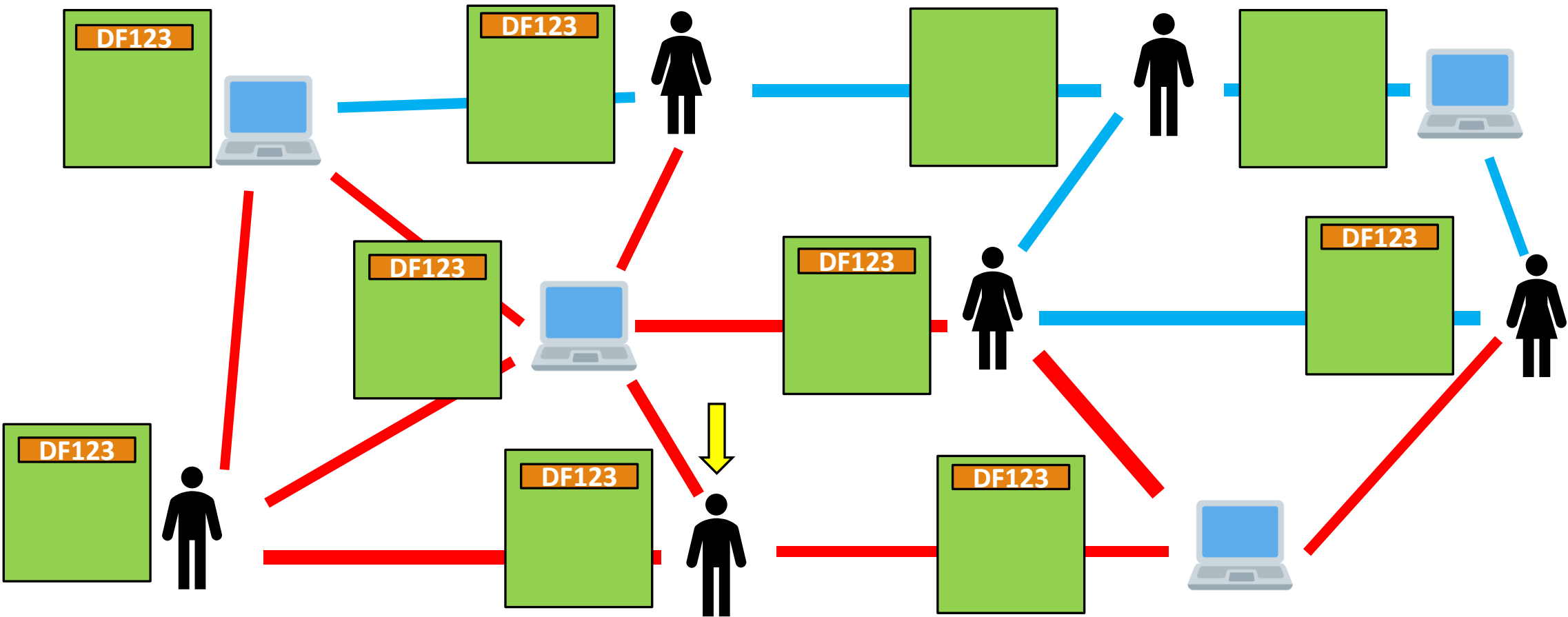
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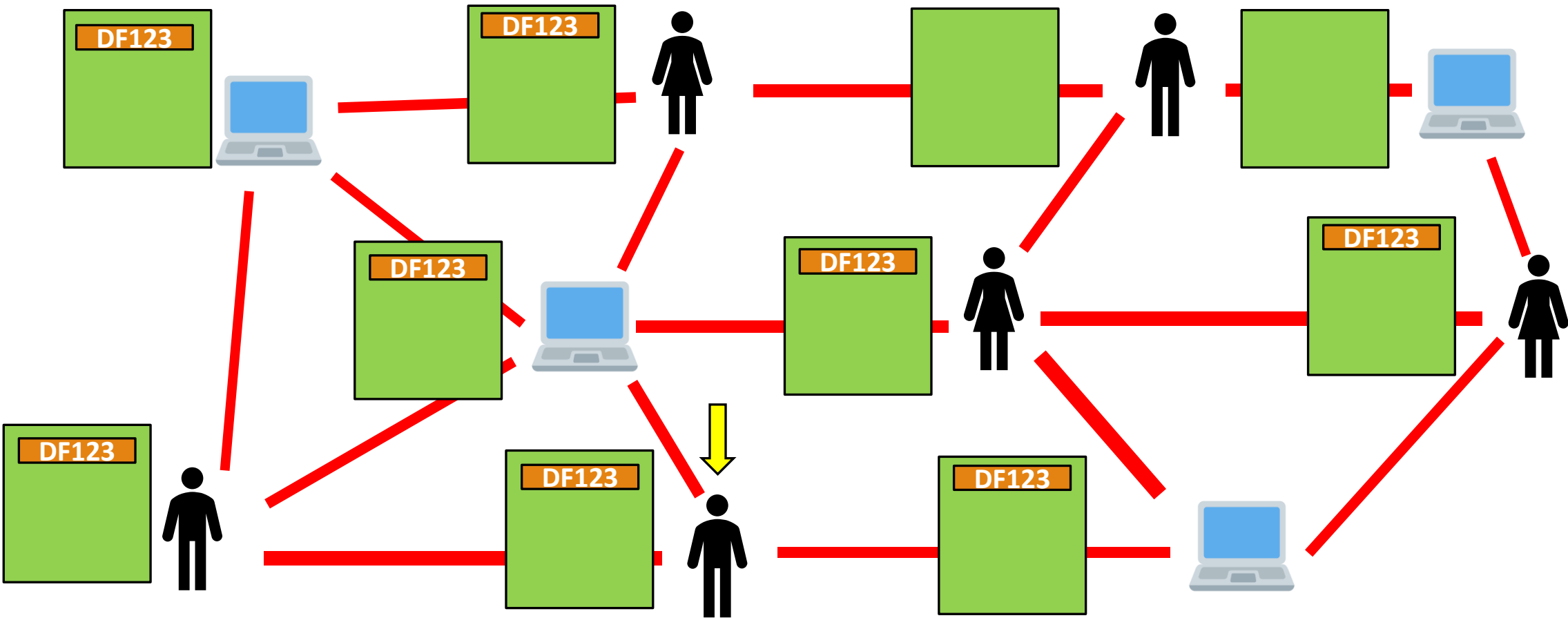
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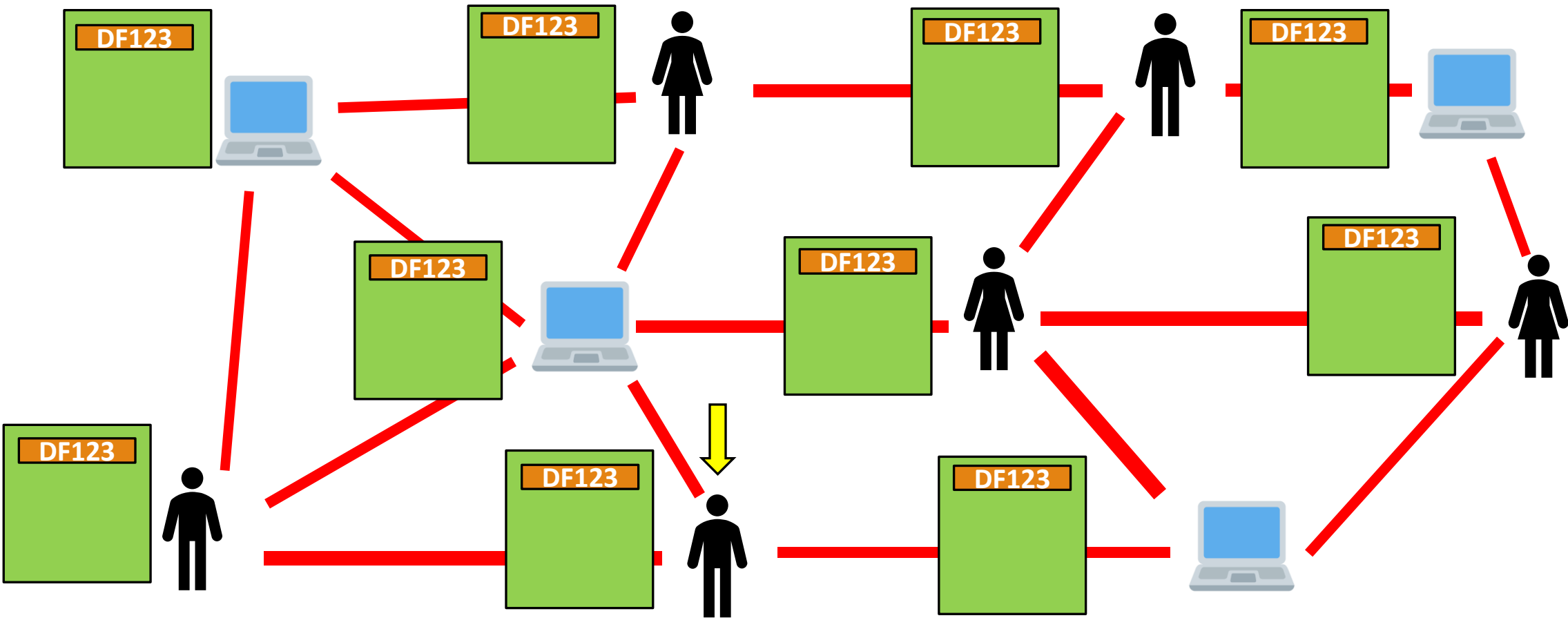
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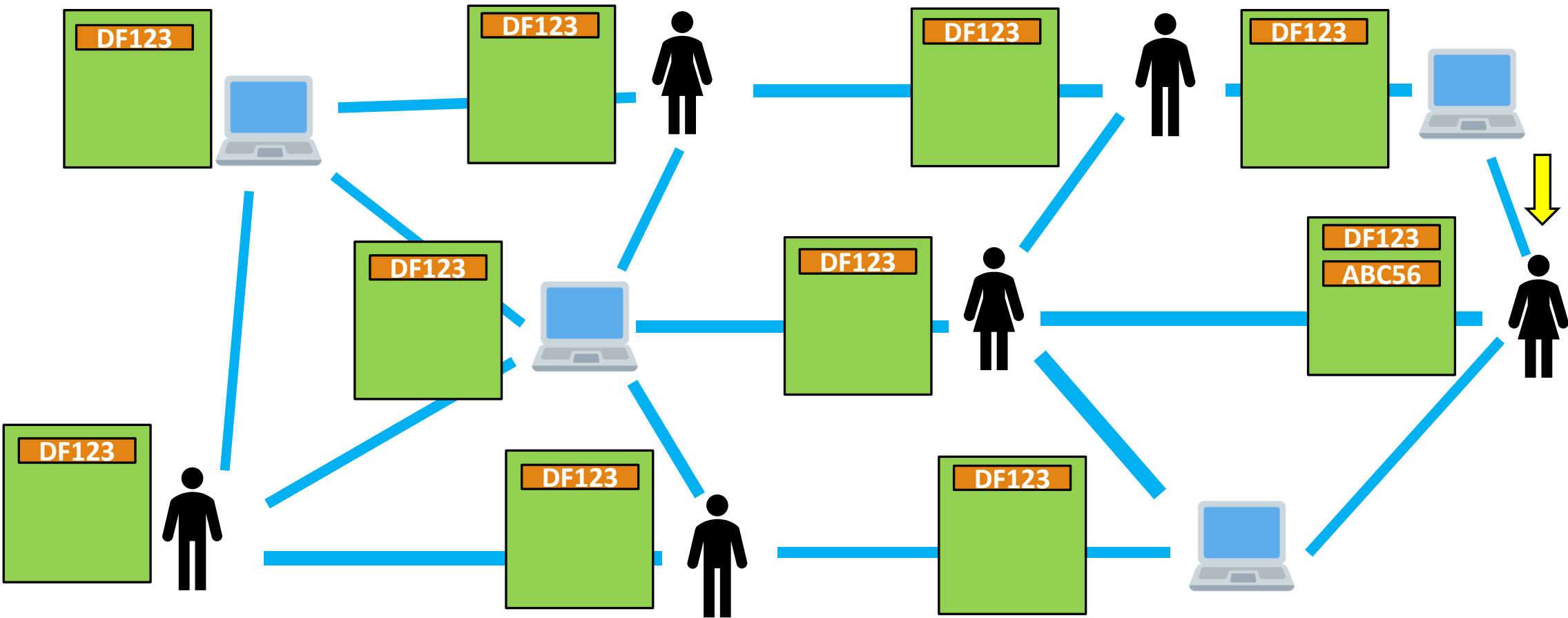
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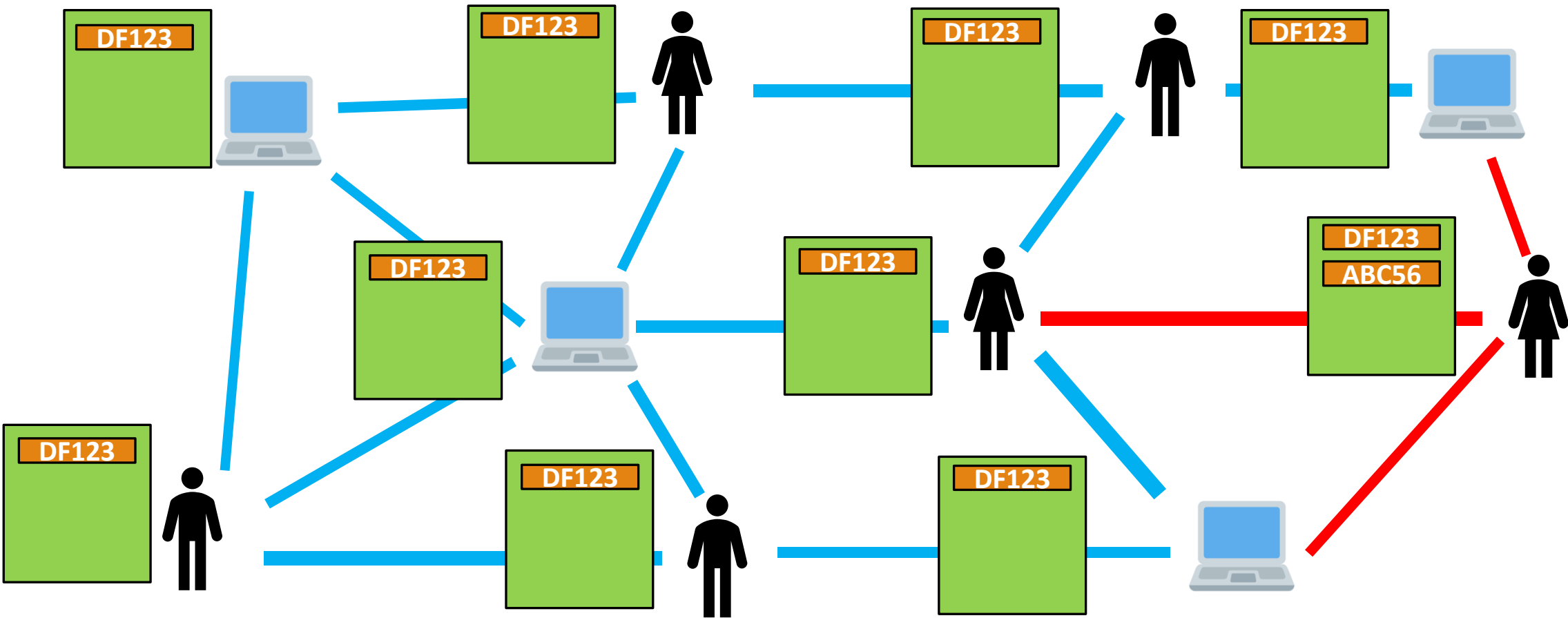
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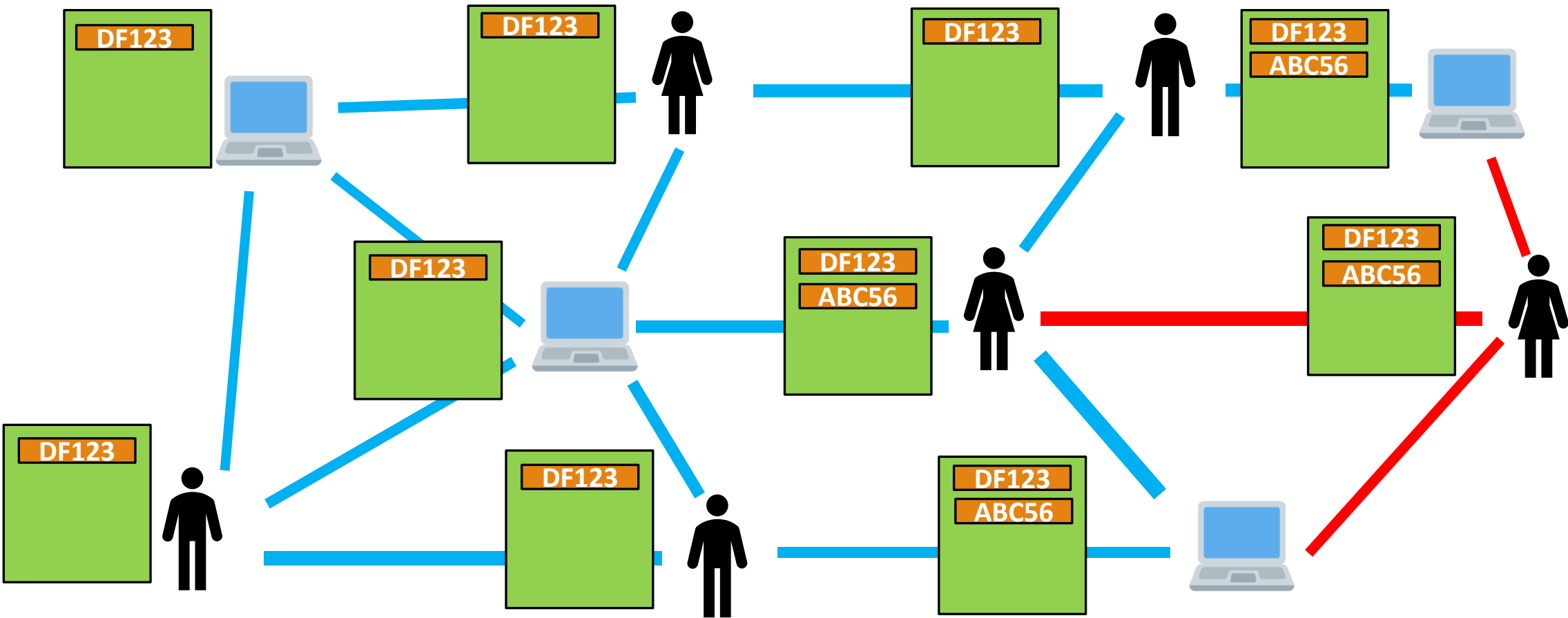
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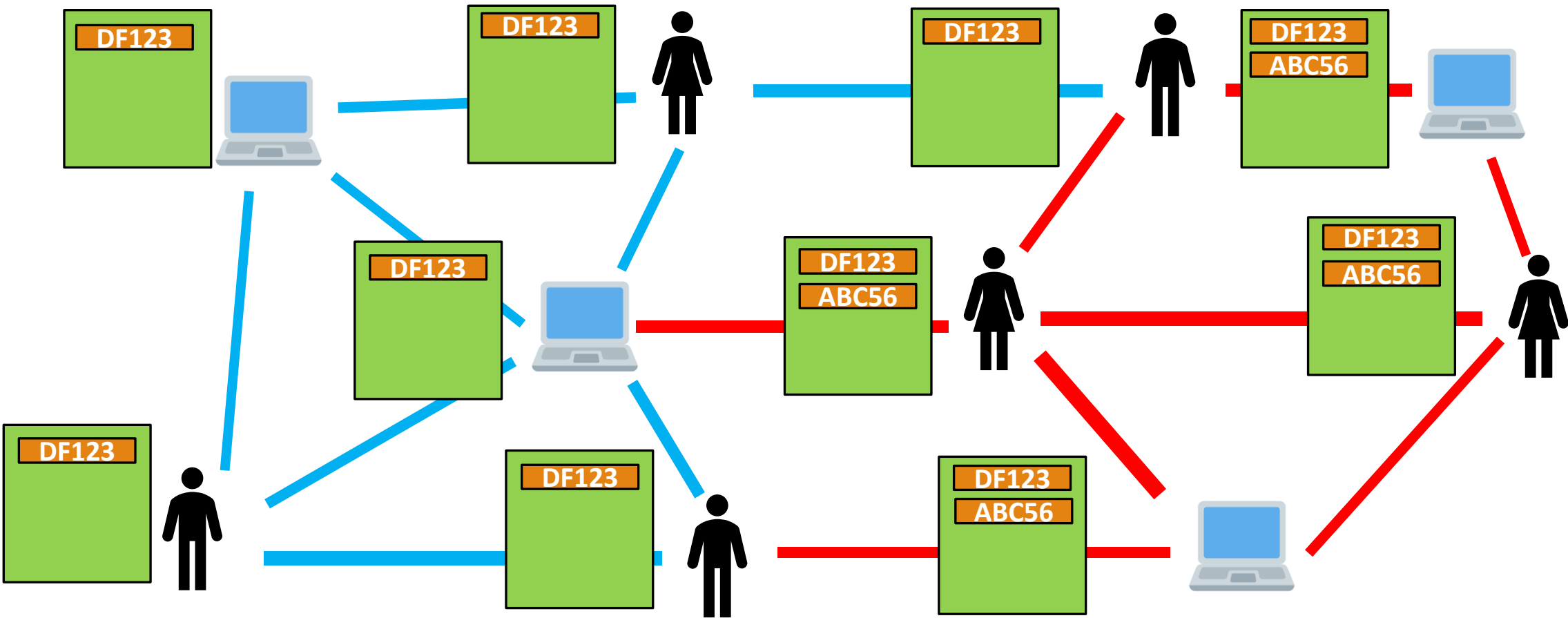
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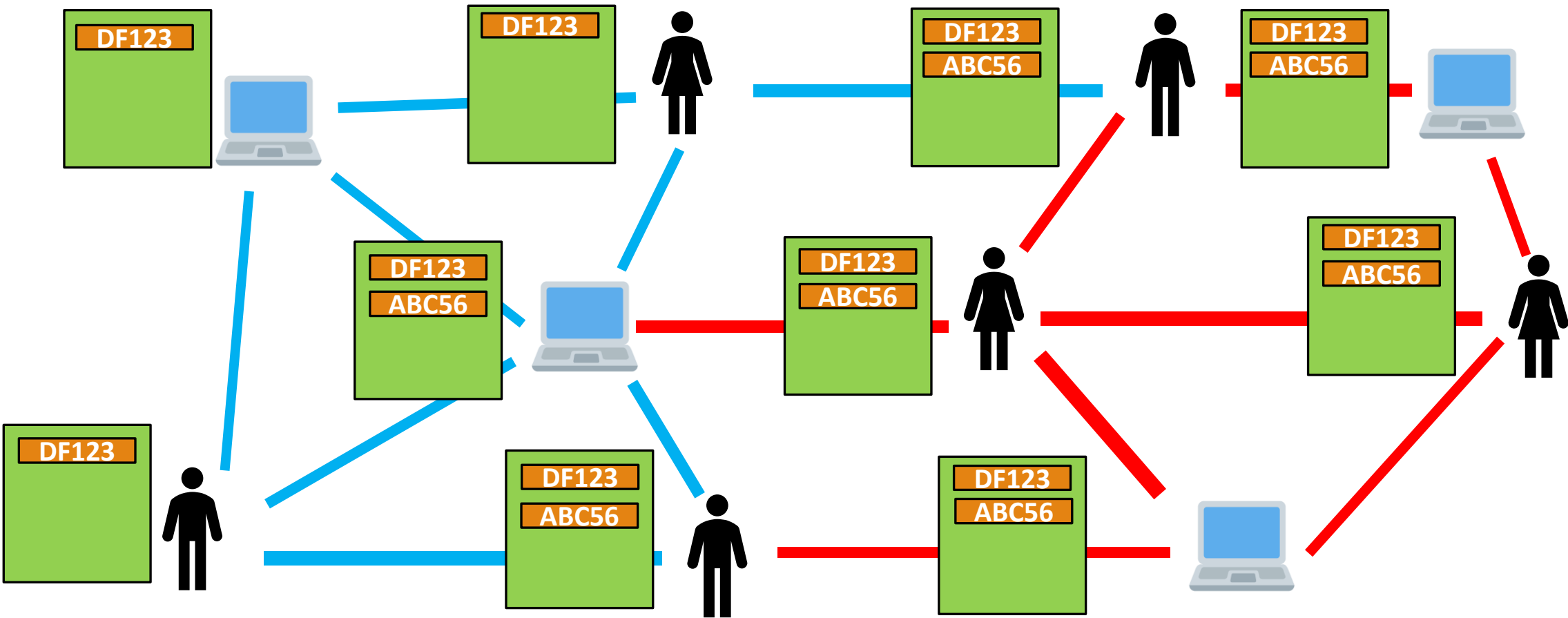
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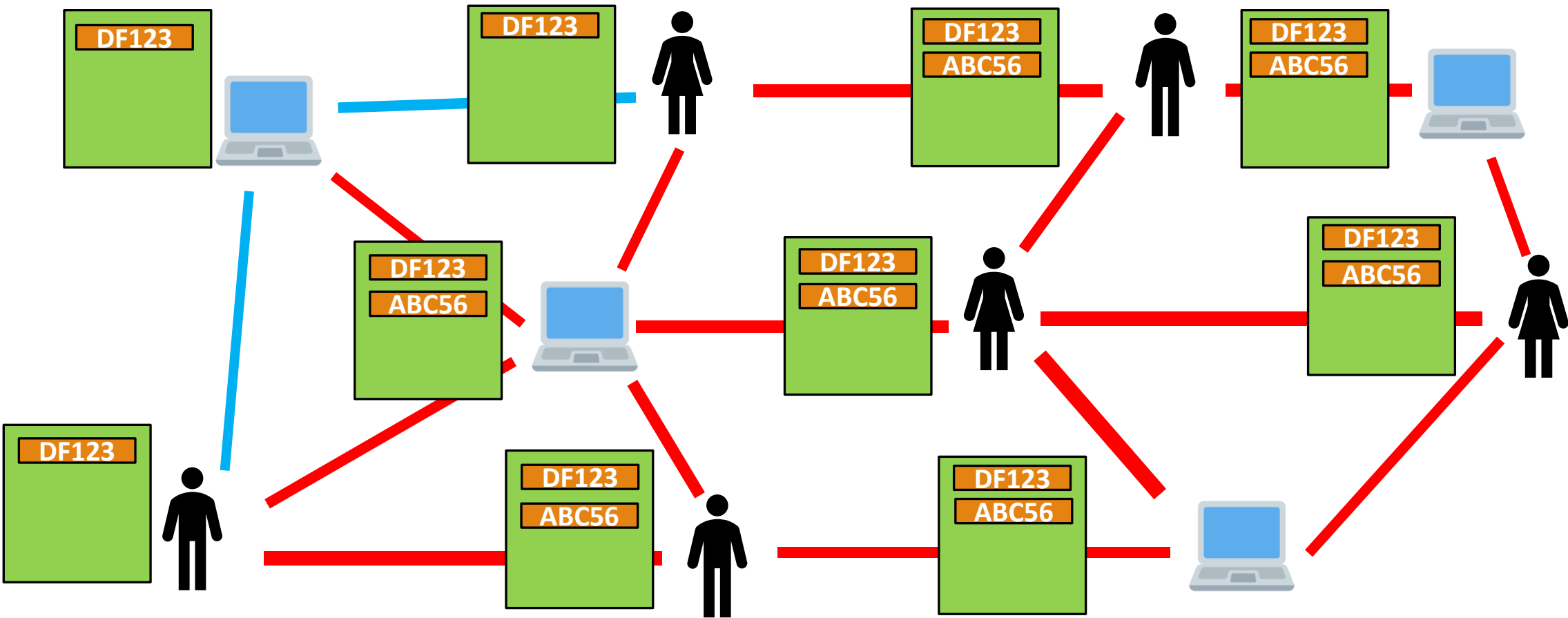
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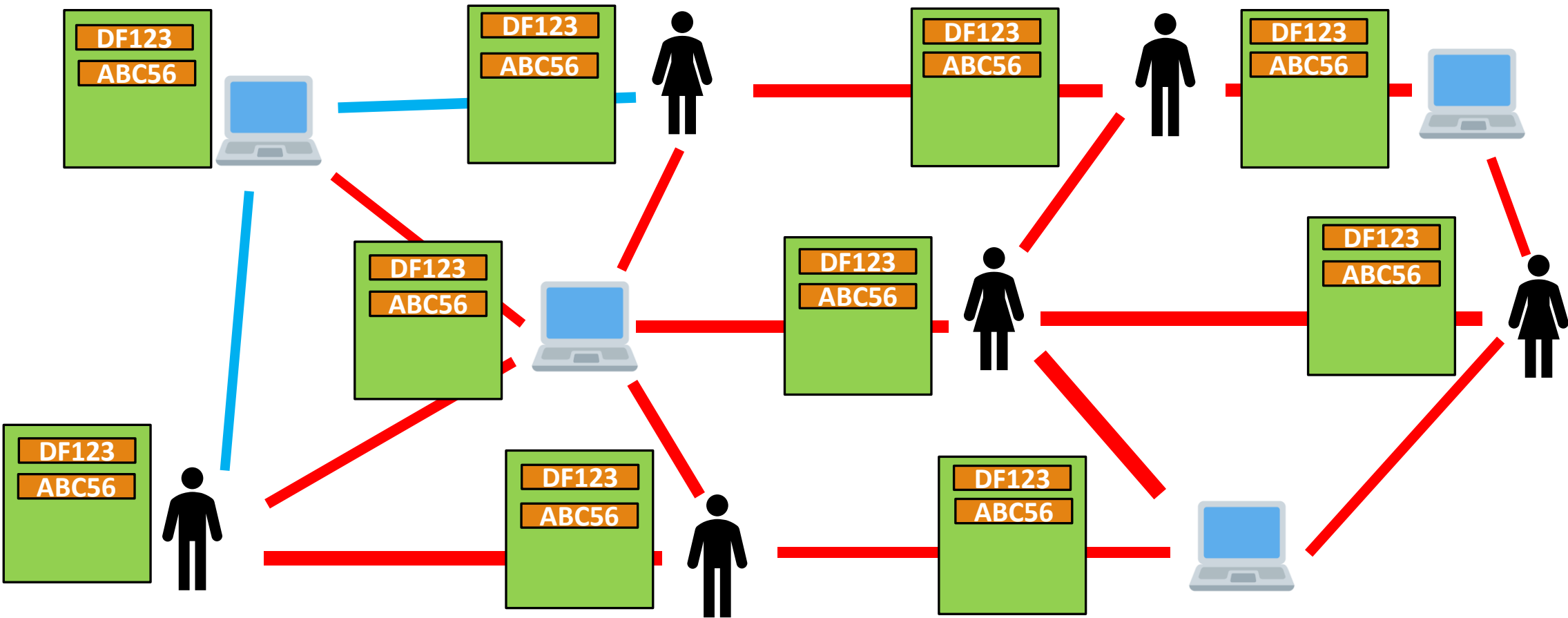
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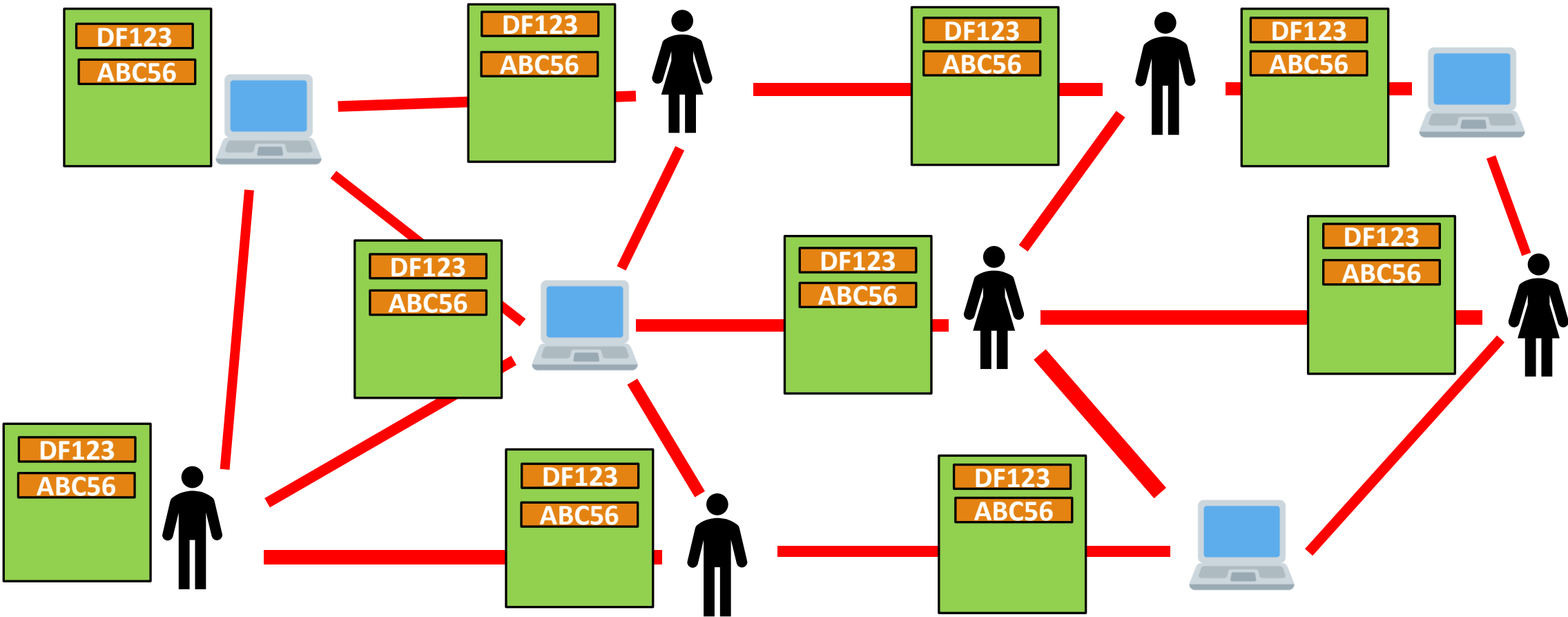
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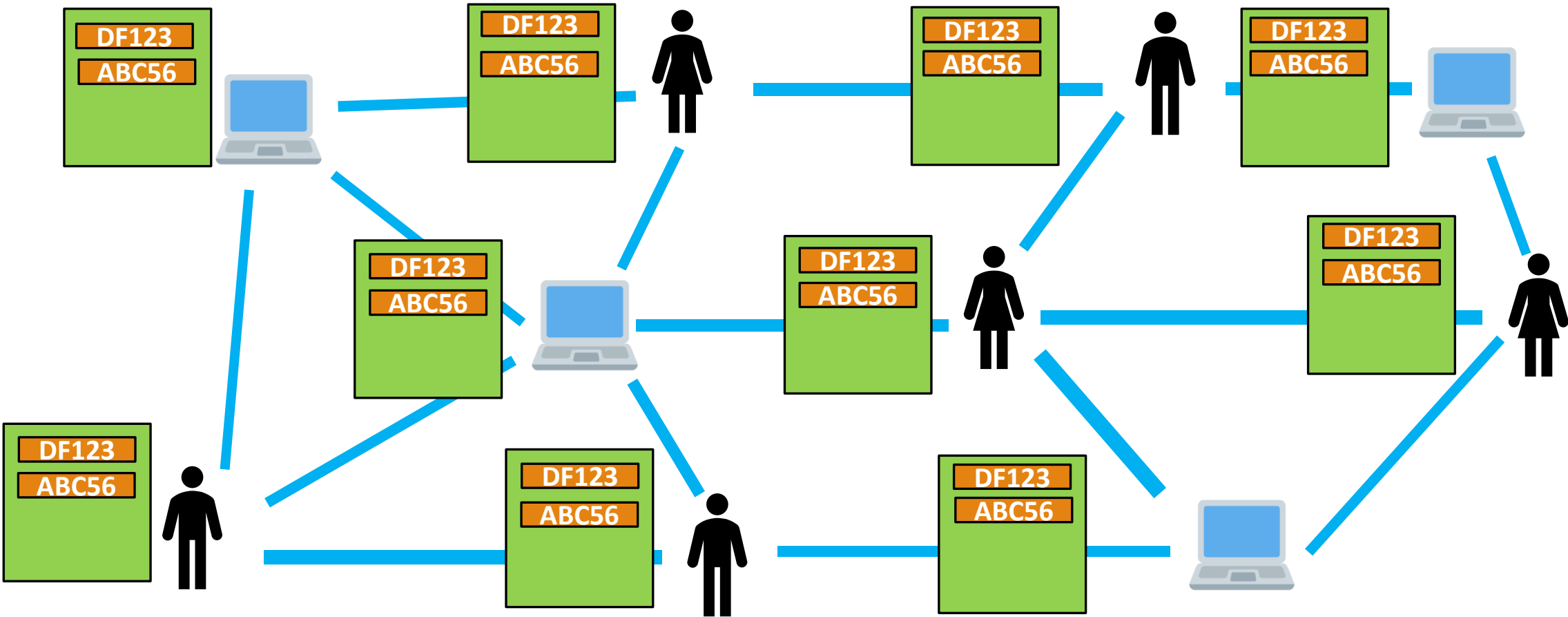
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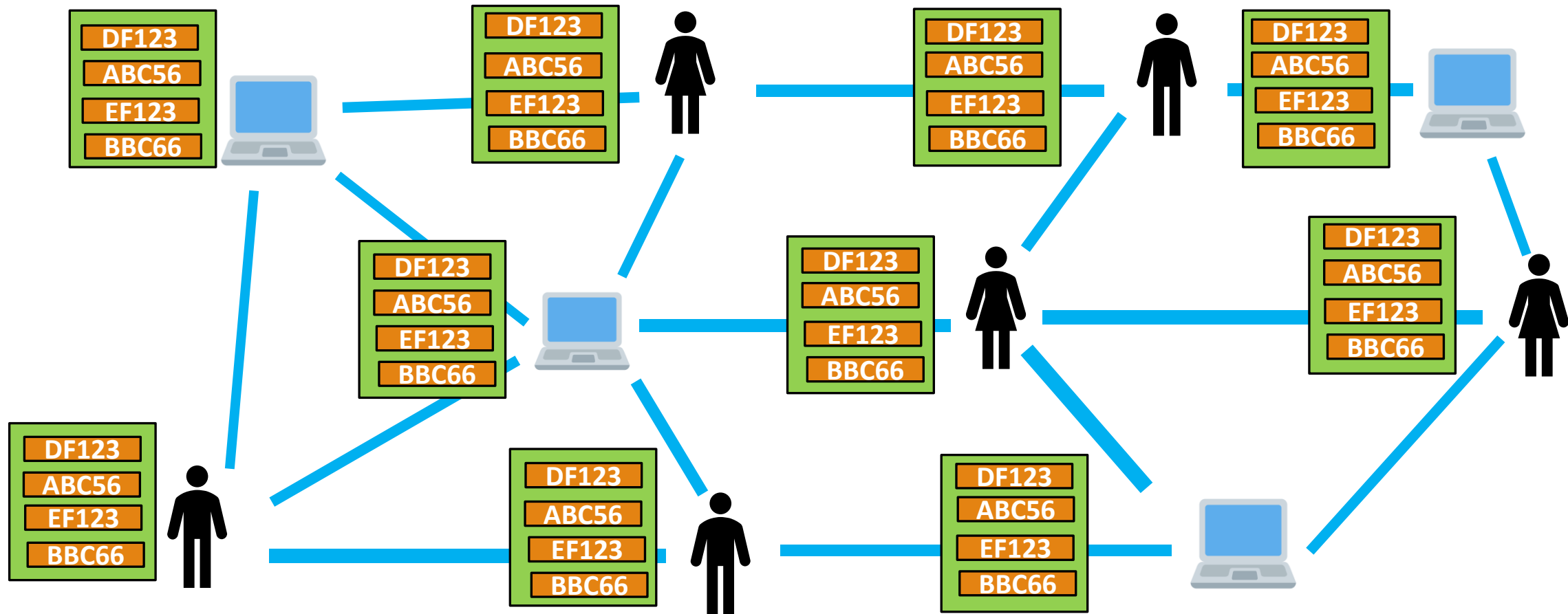


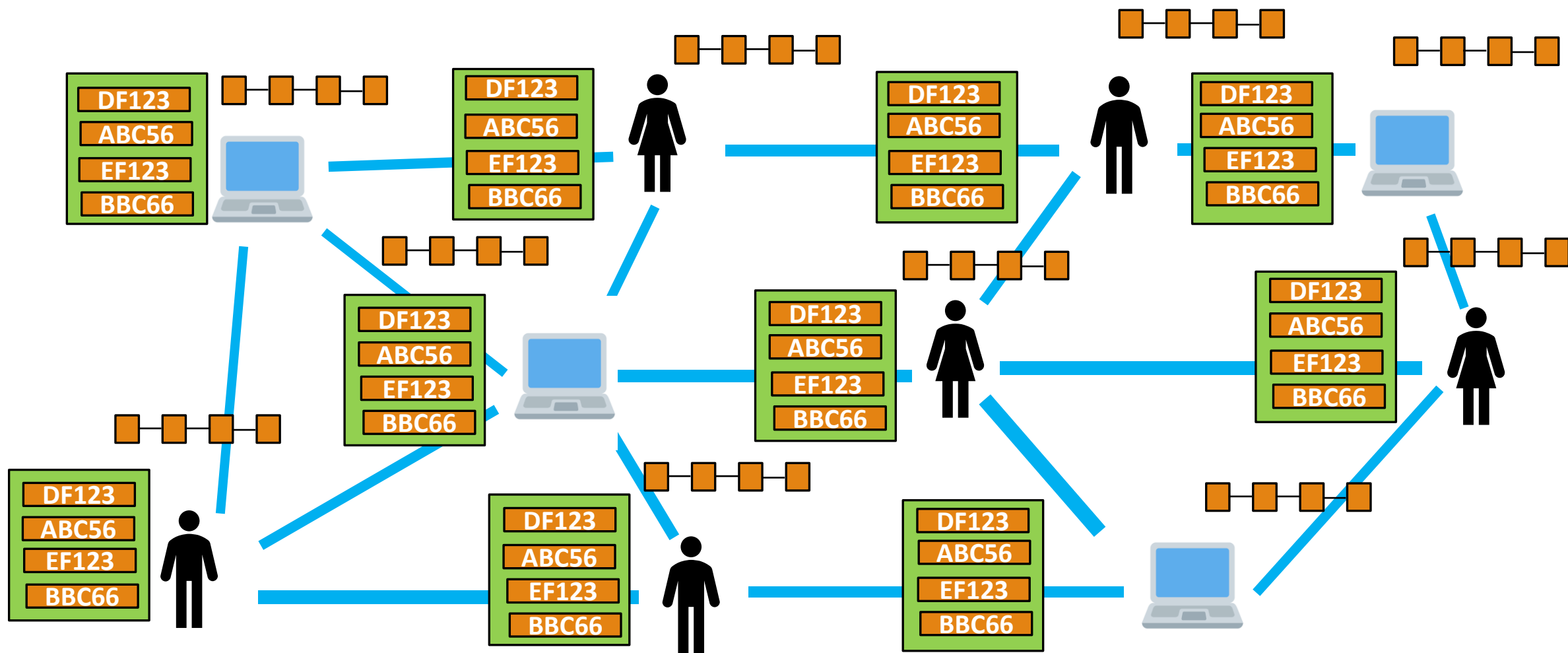
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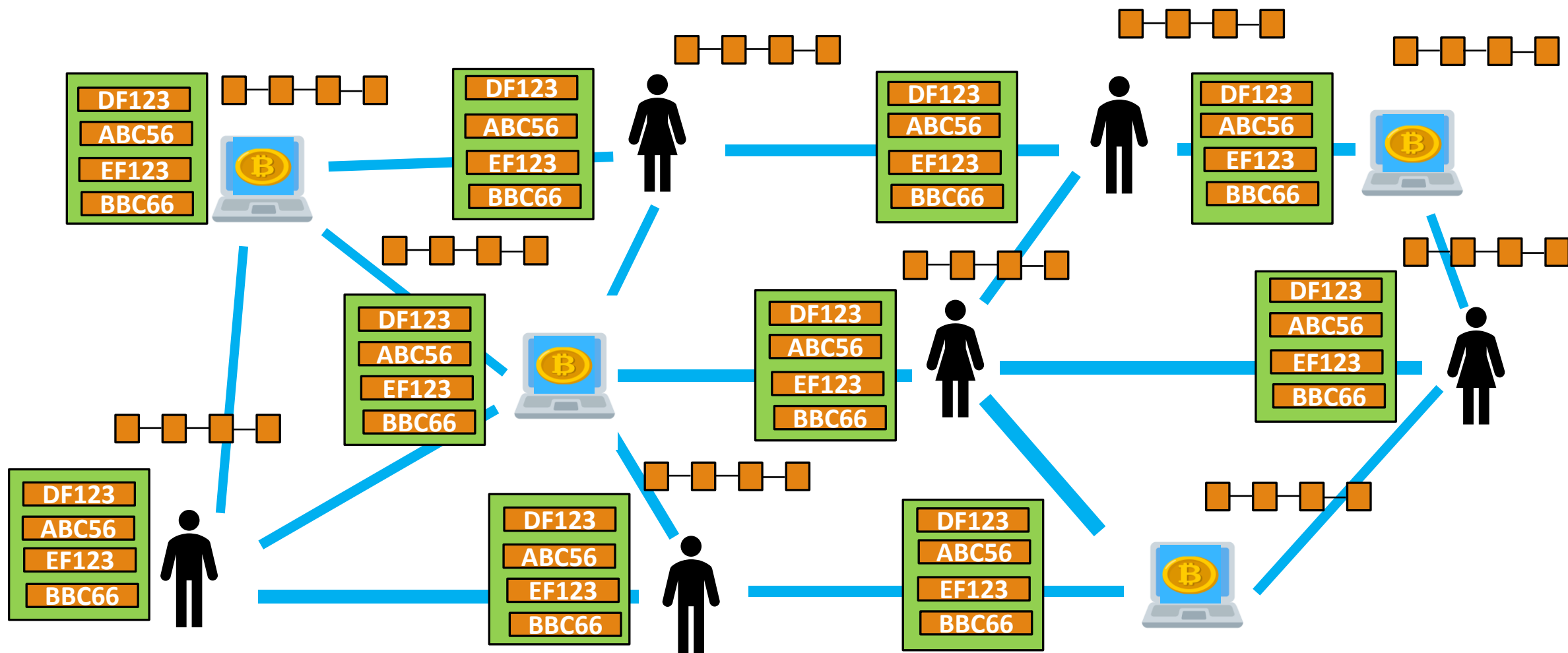


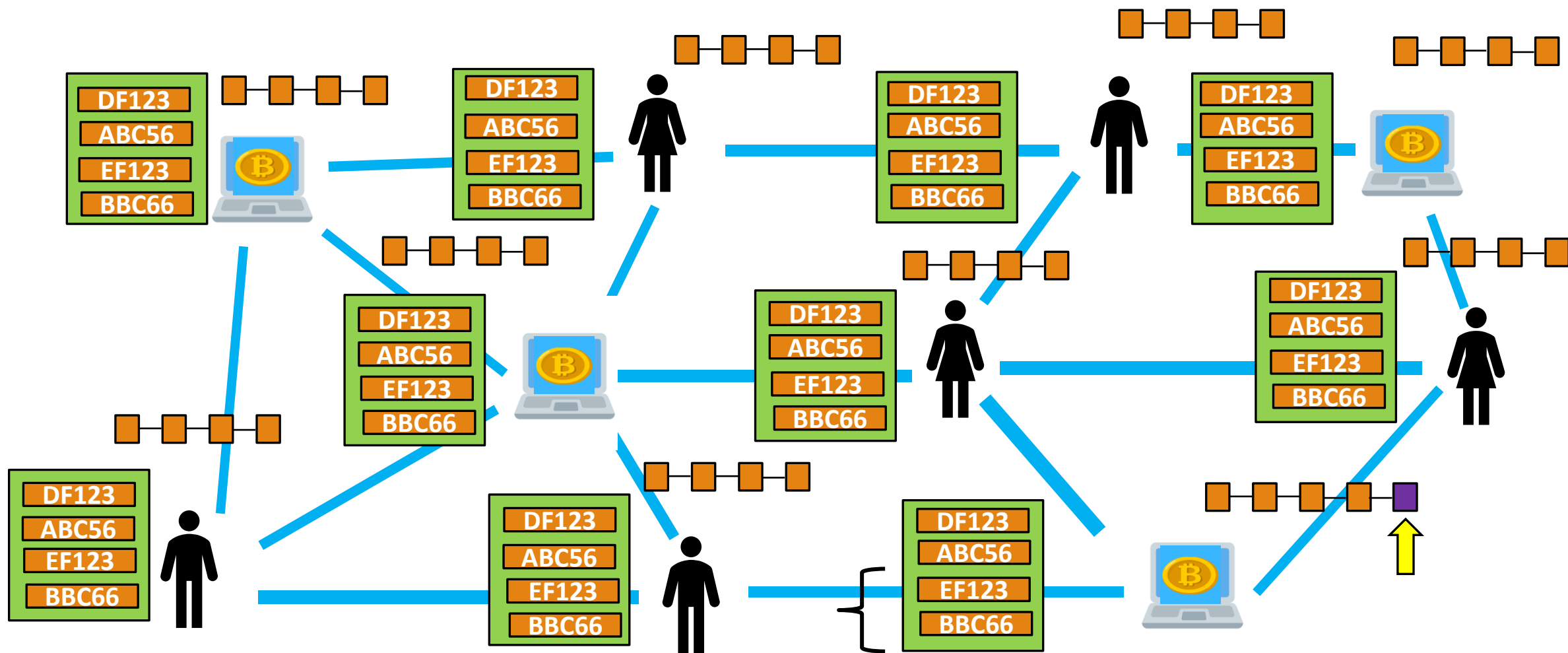
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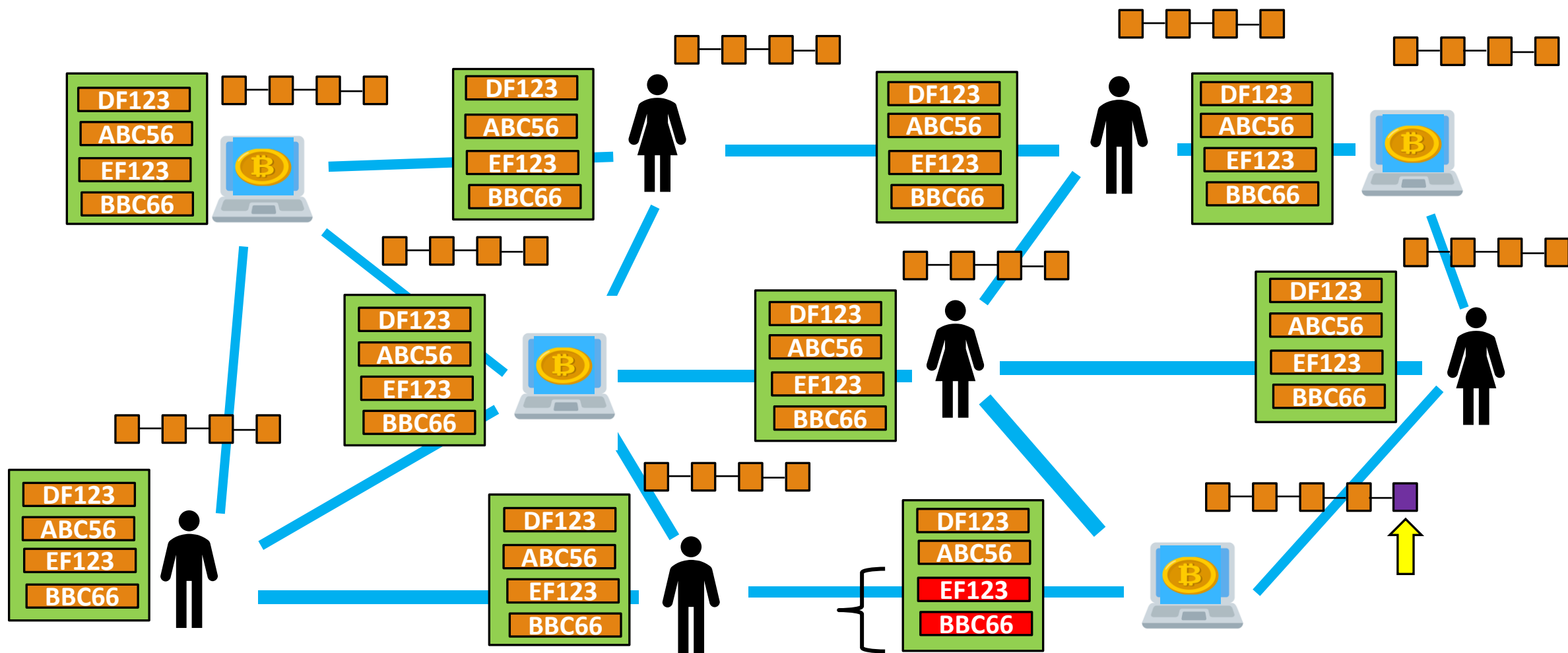


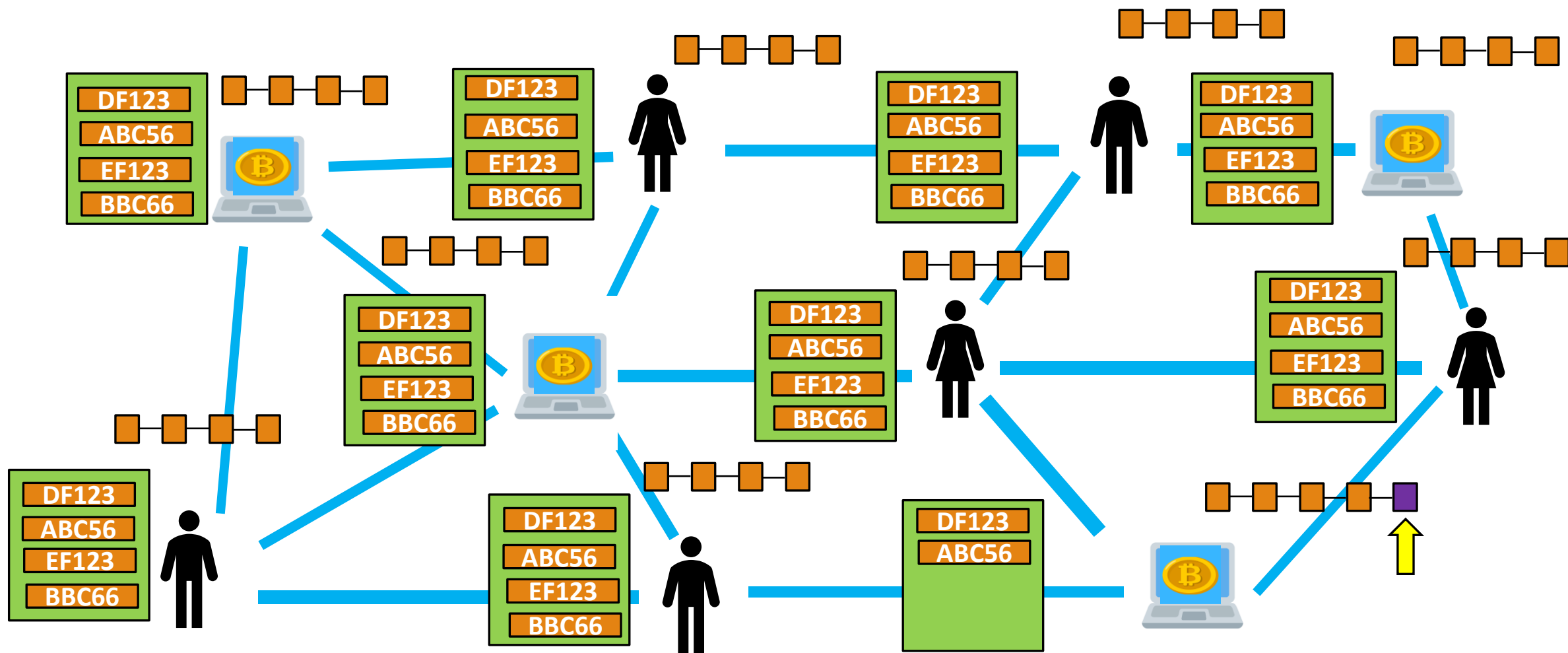


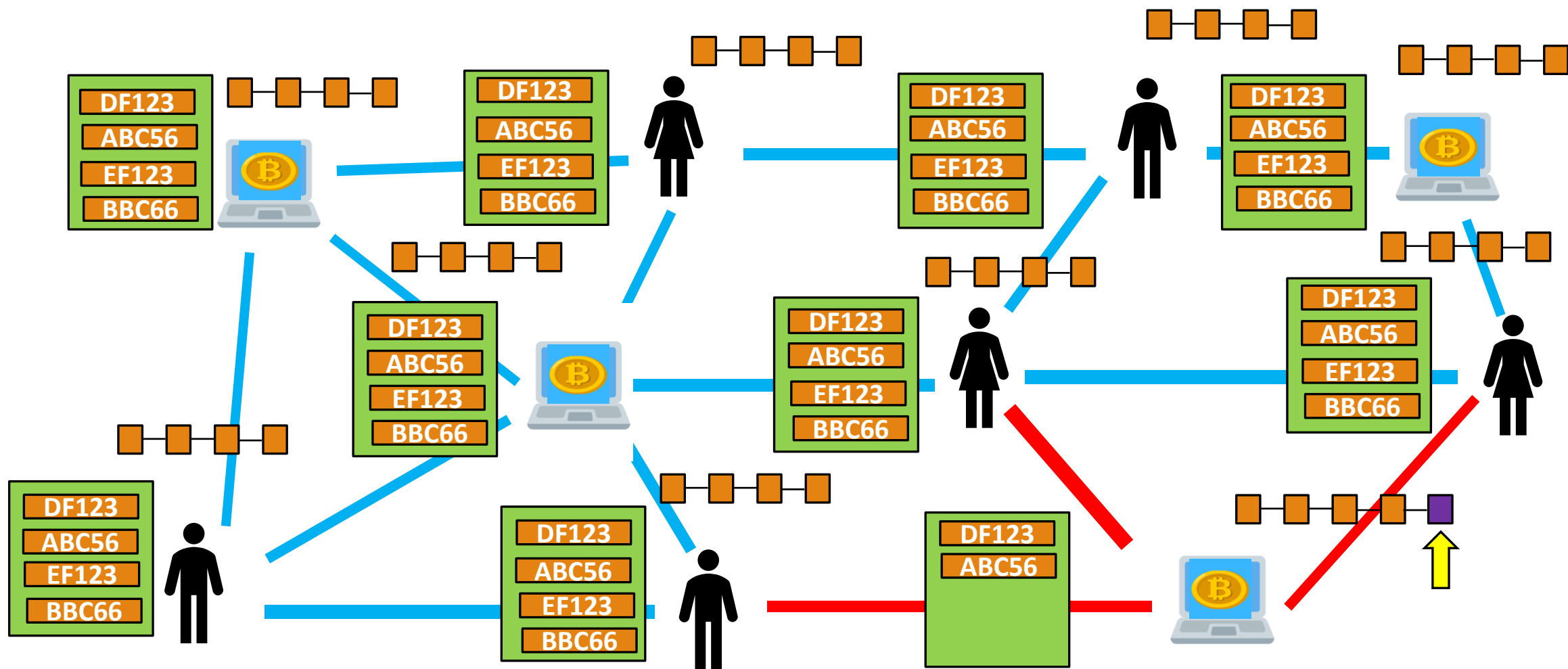


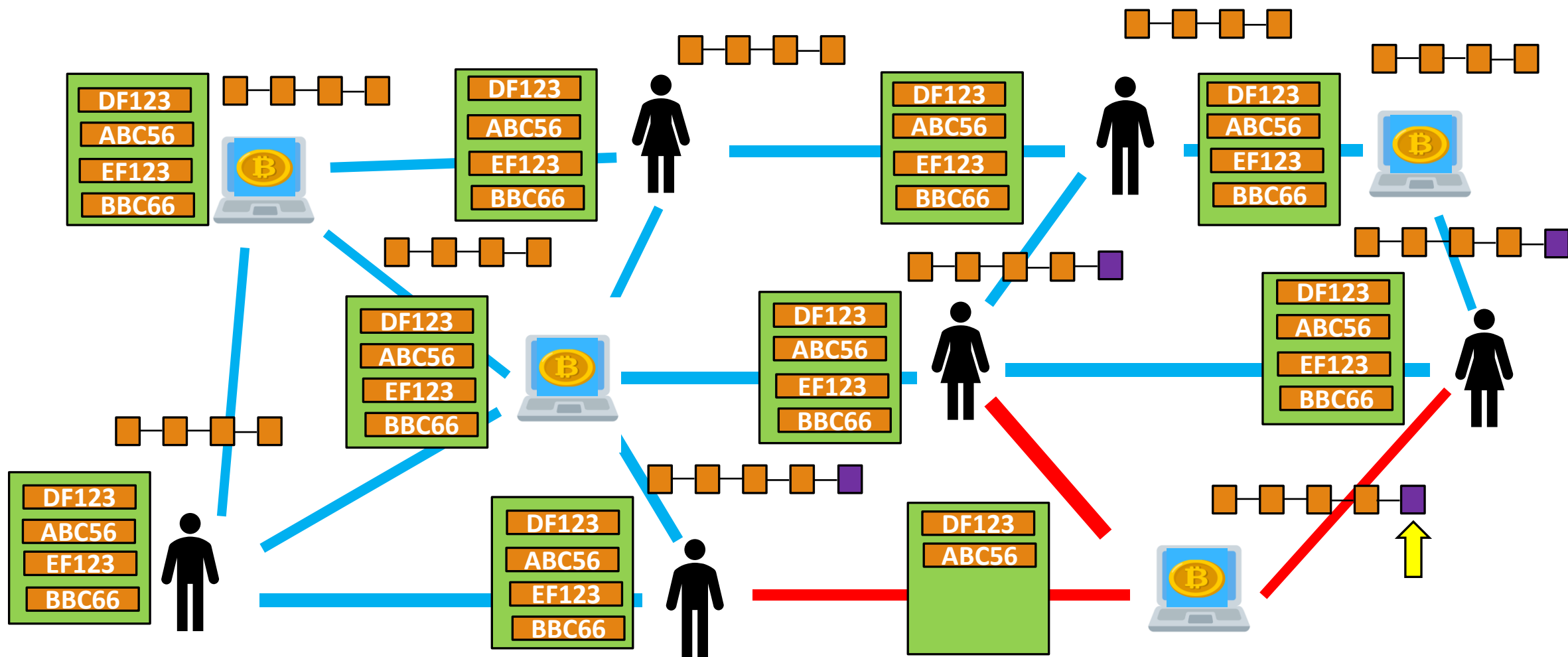


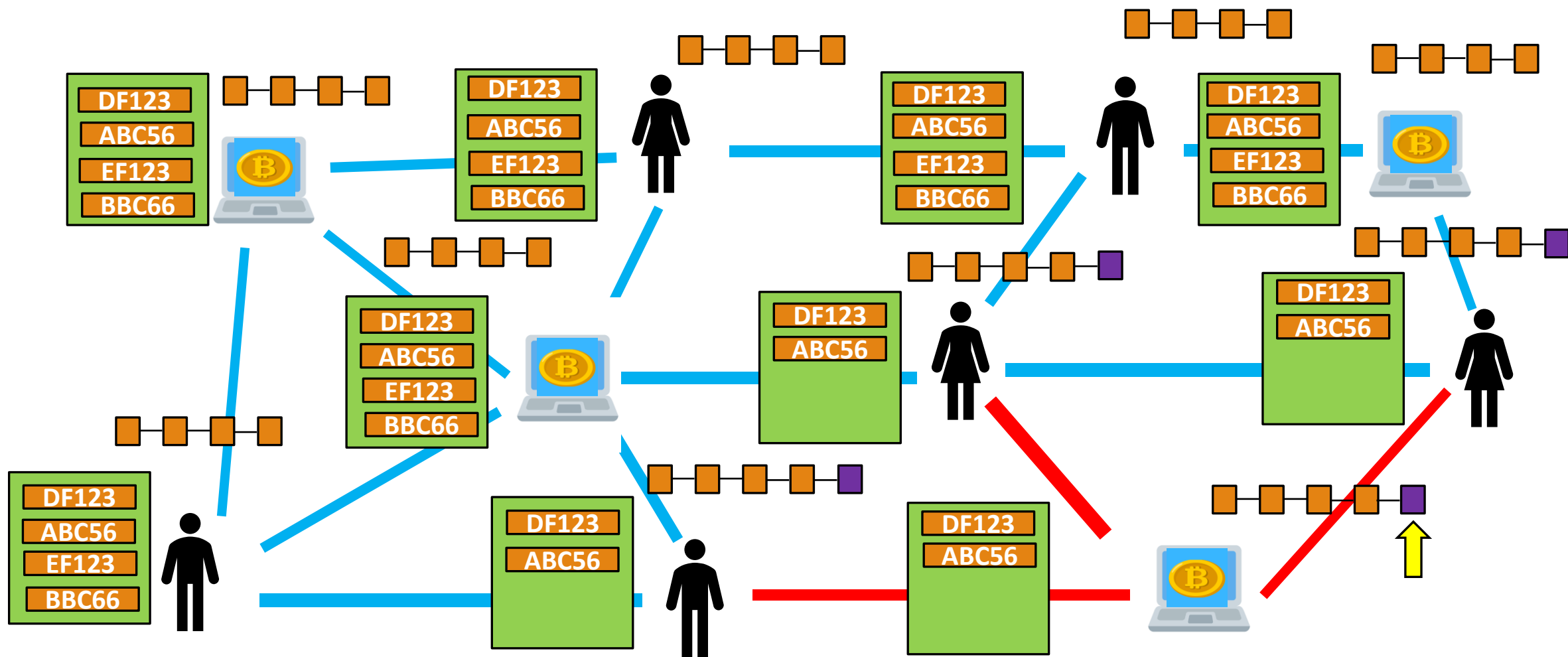


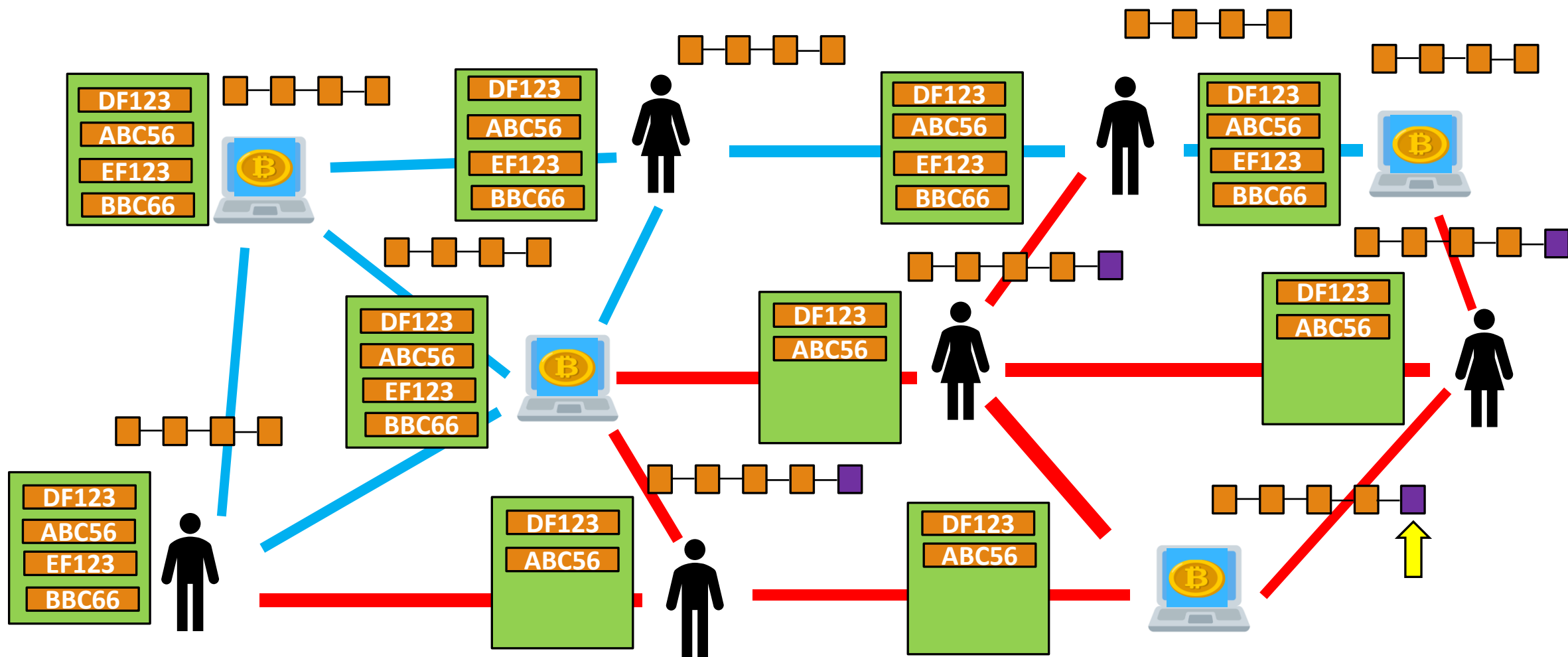


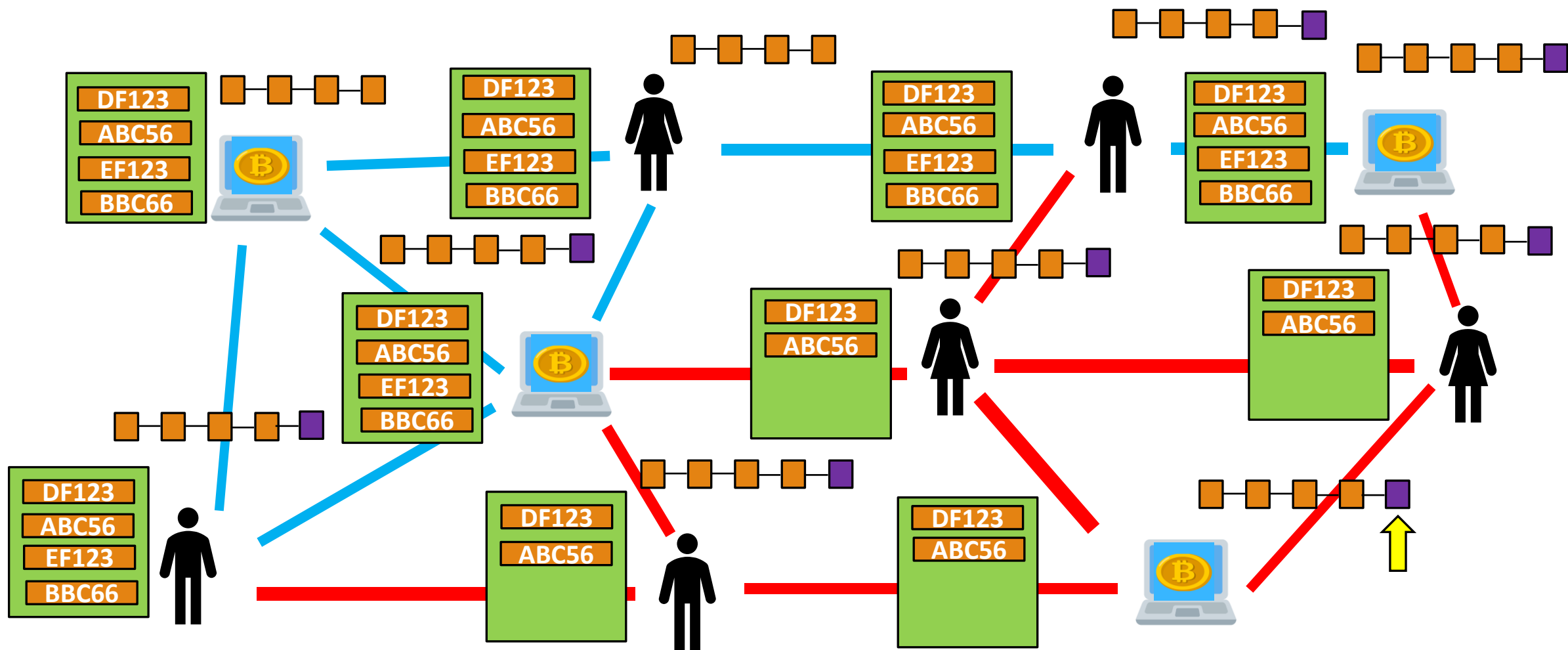


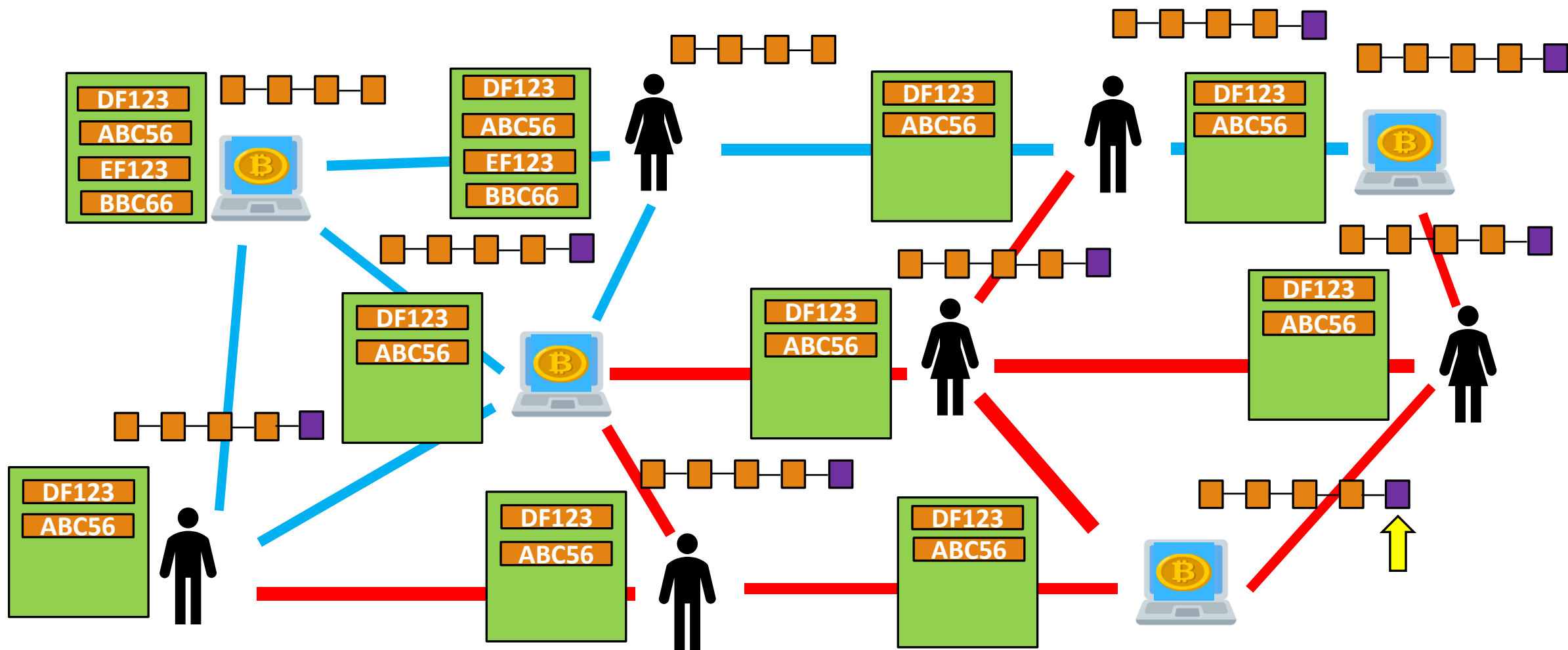


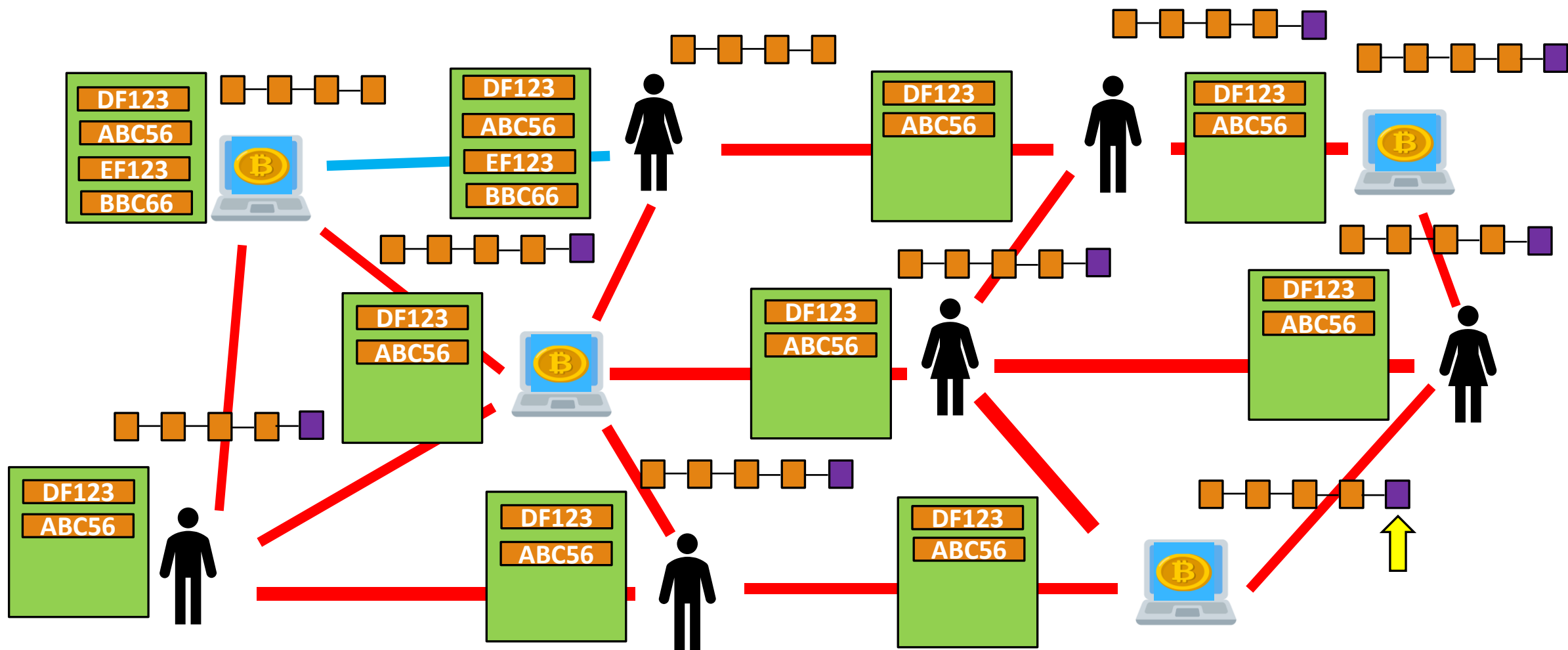


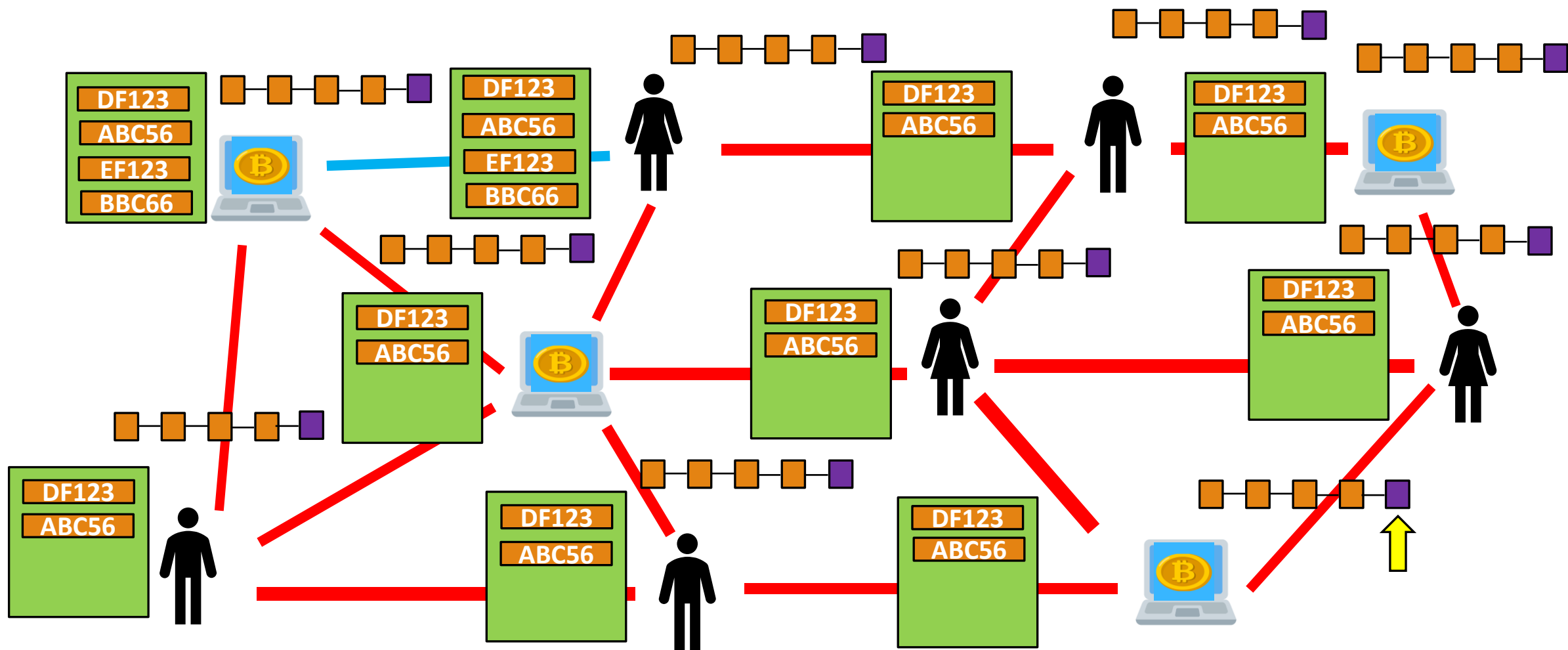


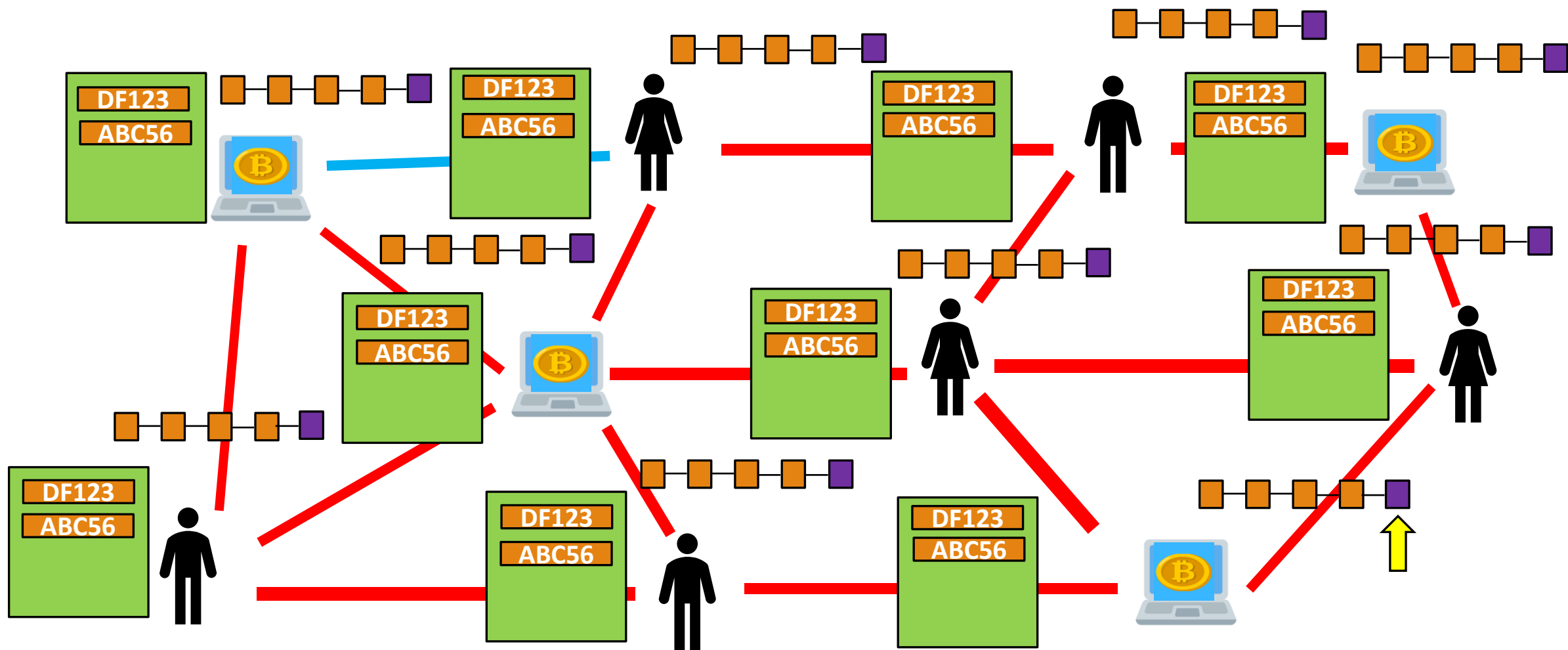


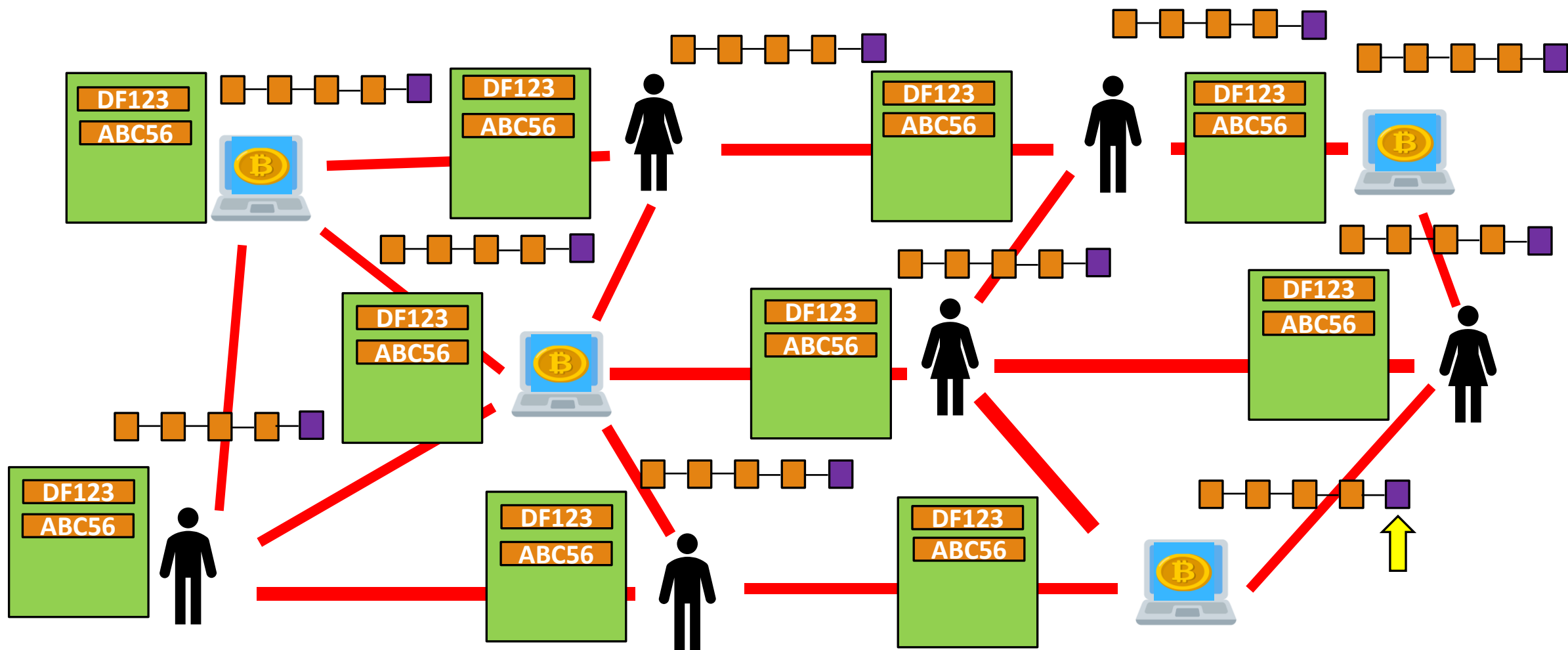


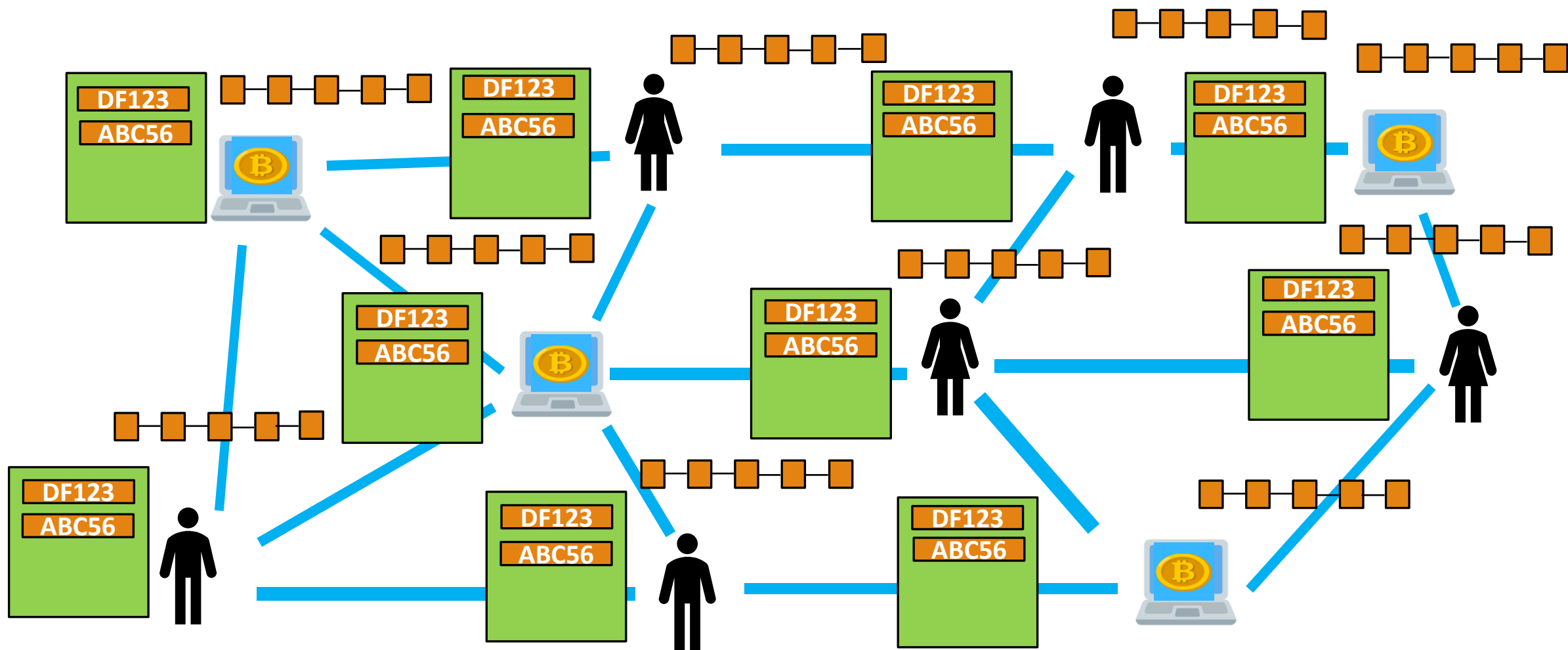














Transaction and UTXOs

Transaction and UTXOs

- Transactions of Cryptocurrency are different from normal transactions
- A **UTXO** (Unspent transaction output) is the amount of digital currency remaining after a cryptocurrency transaction
- To carry out transactions a cryptocurrency wallet is needed
- A wallet (**device or program**) stores **cryptocurrency keys** and allows to access coins.
a **public key** is a **wallet address**, and a **private key** is needed to **sign transactions**.
- In Blockchain, transactions once added never changed, and history remains forever
- The unspent transactions are chosen for further transactions

Transaction and UTXOs

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

Alice -> Me 0.7 BTC

Bob -> Me 0.1 BTC

UTXOs

Let say I buy coffee for 0.5 BTC.



Transaction:

Input:

0.7 BTC from Alice

Output:

0.5 BTC to the coffee shop.

0.2 BTC back to me.

Transaction and UTXOs

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

~~Alice -> Me 0.7 BTC~~

Bob -> Me 0.1 BTC

UTXOs

Let say I buy coffee for 0.5 BTC.



Transaction :

Input:

0.7 BTC from Alice

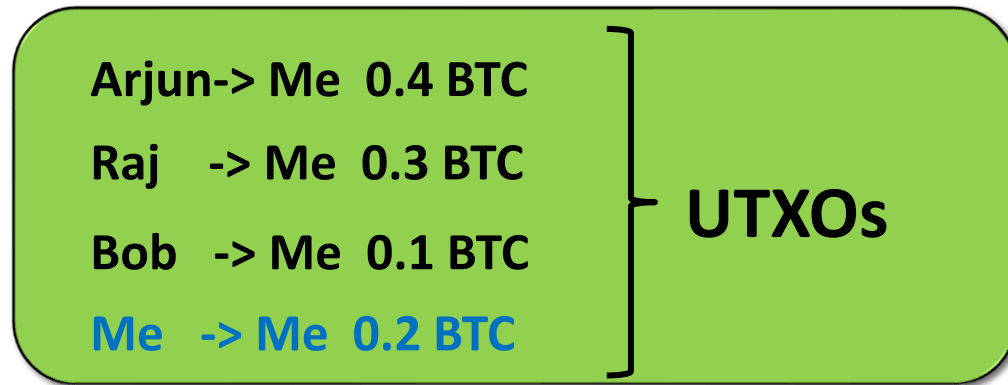
Output:

0.5 BTC to the coffee shop.

0.2 BTC back to me.

UTXO for the coffee shop.

Transaction and UTXOs



Updated UTXOs



Get a Coffee

Transaction and UTXOs

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

Alice -> Me 0.7 BTC

Bob -> Me 0.1 BTC

UTXOs

Let say I buy Noodles for 1.4 BTC.



Transaction :

Input:

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

Alice -> Me 0.7 BTC

Output:

1.4 BTC to the noodles shop.

UTXO for the noodle shop.

Transaction and UTXOs

Bob -> Me 0.1 BTC } UTXOs

Updated UTXOs



Get Noodles



Transaction Fee

Transaction Fee

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

Alice -> Me 0.7 BTC

Bob -> Me 0.3 BTC

UTXOs

Let say I buy coffee for 0.5 BTC.



Transaction:

Input:

0.7 BTC from Alice

Output:

0.5 BTC to the coffee shop.

0.2 BTC back to me.

Transaction Fee

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

Alice -> Me 0.7 BTC

Bob -> Me 0.3 BTC

UTXOs

Let say I buy coffee for 0.5 BTC.



Transaction:

Input:

0.7 BTC from Alice

Output:

0.5 BTC to the coffee shop.

0.1 BTC back to me.

Transaction Fee

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

Alice -> Me 0.7 BTC

Bob -> Me 0.3 BTC

UTXOs

Let say I buy coffee for 0.5 BTC.



Transaction:

Input:

0.7 BTC from Alice

Output:

0.5 BTC to the coffee shop.

0.1 BTC back to me.

Fees: 0.1 BTC

Transaction Fee

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

~~Alice-> Me 0.7 BTC~~

Bob -> Me 0.1 BTC

UTXOs

Let say I buy coffee for 0.5 BTC.



Transaction :

Input:

0.7 BTC from Alice

Output:

0.5 BTC to the coffee shop.

0.1 BTC back to me.

UTXO for the coffee shop.

UTXO for the miner.

Fees: 0.1 BTC

Transaction Fee

Arjun-> Me 0.4 BTC

Raj -> Me 0.3 BTC

Bob -> Me 0.1 BTC

Me -> Me 0.1 BTC

UTXOs

Updated UTXOs



Get Coffee