How Local are Ripple Transactions

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Semester Project Presentation

School of Computer and Communication Systems
Decentralized and Distributed Systems lab
Exchange value as quickly as information
WALLETS

Persons
50 XRP

Gateways
1000 XRP

CREDIT LINK

A
100 / 300 EUR

B

NODES

Stock servers

Validators
• Direct XRP transactions
• Path-based transactions
Alice
50 XRP

Bob
20 XRP
Alice: 50 XRP
Bob: 20 XRP
Stock servers
Validators
Validators
USD / EUR : 0.9
Using nodes to get the senders location:
Using nodes to get the senders location:

- Use the Ripple Crawler
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Using nodes to get the senders location:

- Use the Ripple Crawler
- Connect to existing nodes
Using nodes to get the senders location:

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Using nodes to get the senders location:

- Use the Ripple Crawler 
- Connect to existing nodes 
- Running our own node
Using nodes to get the senders location:

- Use the Ripple Crawler  
- Connect to existing nodes  
- Running our own node  

[Image of EPFL logo]
Running a gateway
Running a gateway
Can we try to correlate the currency usage to the number of nodes in a given country?

Repartition of nodes in countries

- United States: 28.31% (248)
- Germany: 13.24% (116)

Volume (in XRP) for top 10 currencies

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Japan: 12.56% (110)
South Korea: 8.11% (71)
Singapore: 6.96% (61)
China: 5.37% (47)
Others: 25.46% (223)
We are left with transactions
For wallets that have credit links

Not with gateways
Currency of credit links with gateways

- 2 currencies: 19%
- 3 and more: 6%
- 31% without gateways
- 69% with gateways
Gateways as first and last hop?
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Number of transactions processed by gateways as first hop for USD in 2017 per month

Gatehub (UK), United States
Bitstamp (UK), United States
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Number of transactions processed by gateways as last hop for USD in 2017 per gateway

- rNQLW47MCc4tgwVcjILfUqPjHQ3UmhtPj
- Bittstamp (Britain (UK), United States)
- ranGRmZaH9ec2ed6ghxxgVJXZQN52yEhZ
- Mr. Exchange (Japan, ?)
- Gatehub (Britain (UK), United States)
Currencies

How sender and receiver currencies are linked?
• Could not have any information from nodes

• Significant same sender and receiver currency in transactions. Cross currency is not dominant

• Gateways tends to specialize.

• Gateways are situated in the country of the currency they want to convert for USD
• Gateways are situated in the country of the currency they route except for USD.

https://github.com/dedis/student_19_ripple-locality
{"fee": 1e-05,
"hash": "3F7A1B3A771D477B03104E86CE73790BB8C8E516BEE680BB4AD9893444D21CF3",
"sender": "rHb9CJAWyB4rj91VRWn96DkukG4bwdtyTh",
"success": "tesSUCCESS",
"XRPAcc": [
{
"isIncr": false,
"account": "rHb9CJAWyB4rj91VRWn96DkukG4bwdtyTh",
"amount": 1.100000000064938e-05
},
{
"isIncr": true,
"account": "rbvFfuUysurzPHq5kgs53A16j5svbFxgv",
"amount": 1.000000111620804e-06
}
],
"flags": "",
"receiver": "rbvFfuUysurzPHq5kgs53A16j5svbFxgv"}
"date": "2013-06-29T13:10:20+00:00",
"actualIssuerReceiver": "--",
"receiverCurrency": "XRP",
"receiverAmount": "0.000001",
"senderCurrency": "XRP"
}

"links": [
{
"isInc": false,
"currency": "GKO",
"amount": 0.8964589870013441,
"node1": "rQ9ArM8TdHmeQHvd969nQPP1TZosBhzdXg",
"node2": "ruazs5h1qEsqpke88pcqnaeXdm6od2xc",
"holder": "rQ9ArM8TdHmeQHvd969nQPP1TZosBhzdXg"
},
{
"isInc": true,
"currency": "GKO",
"amount": 0.8964589870013242,
"node1": "rLm7SJ73IAoN1XDiKsqWEf4W8Ba2bVB6y",
"node2": "ruazs5h1qEsqpke88pcqnaeXdm6od2xc",
"holder": "rLm7SJ73IAoN1XDiKsqWEf4W8Ba2bVB6y"}


```
{
    "account": "rUPIAddSwJTrkWzGX4aHG1u7eZg9GTV6Bd",
    "ledger_current_index": 46580945,
    "lines": [
      {
        "account": "rfYv1TXnwgDDK4WQNbFALKYuEBnrR4pDX",
        "balance": "0.00001492689992518072",
        "currency": "BTC",
        "limit": "0",
        "limit_peer": "0",
        "no_ripple": true,
        "quality_in": 0,
        "quality_out": 0
      },
      {
        "account": "rfYv1TXnwgDDK4WQNbFALKYuEBnrR4pDX",
        "balance": "0",
        "currency": "LTC",
        "limit": "0",
        "limit_peer": "0",
        "no_ripple": true,
```
"quality_in": 0,
"quality_out": 0
},
],
"status": "success",
"validated": false
}

3 621 347 transactions had paths over the 31 028 222