Interledger

Overview

Adrian Hope-Bailie
@ahopebailie


#weaccept

What methods of payment does Airbnb accept?

Payment options may include:

- Major credit cards and pre-paid credit cards (Visa, MasterCard, Amex, Discover, JCB)
- Many debit cards that can be processed as credit
- PayPal for select countries
- Alipay for China only
- Postepay for Italy only
- Sofort Überweisung for Germany only
- iDEAL for the Netherlands only
- Boleto Bancário, Hipercard, Elo, and Aura for Brazil only
- PayU for India only
- Google Wallet for US Android App only
- Apple Pay for iOS App only

Fredrick

Dar es Salaam, Tanzania

Money is lost to third parties […] such as **Western Union** and **SWIFT**.
It happened to me whereby Airbnb sent **$29** and I received only **$9**.

Money is lost to third parties [...] such as **Western Union** and **SWIFT**.
It happened to me whereby Airbnb sent **$29** and I received only **$9**.

What is wrong with **joining PayPal** in Tanzania?

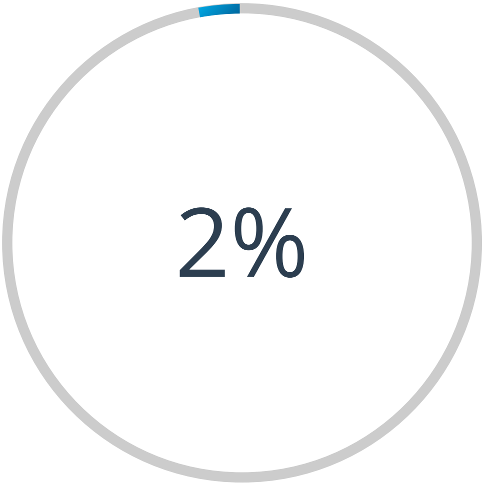
It happened to me whereby Airbnb sent **$29** and I received only **$9**.

What is wrong with **joining PayPal** in Tanzania?

I have a Paypal account. However PayPal is not the same all over the world too. It has "send-only" countries. Tanzania is a **send-only country**. Which means I can use PayPal to send (spend) money, but **I can not receive money** (get paid) through PayPal.

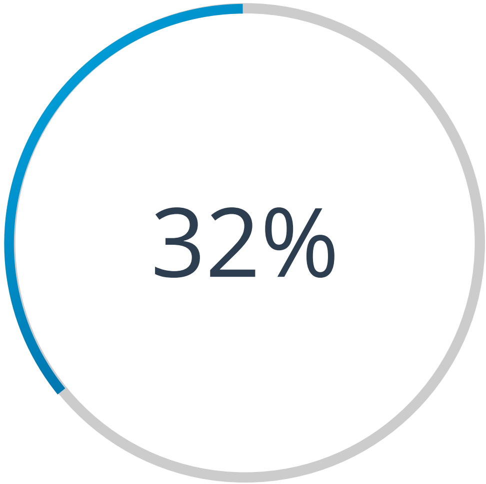
I have a Paypal account. However PayPal is not the same all over the world too. It has "send-only" countries. Tanzania is a **send-only country**. Which means I can use PayPal to send (spend) money, but **I can not receive money** (get paid) through PayPal.

The Airbnb platform is **not really for you** then.



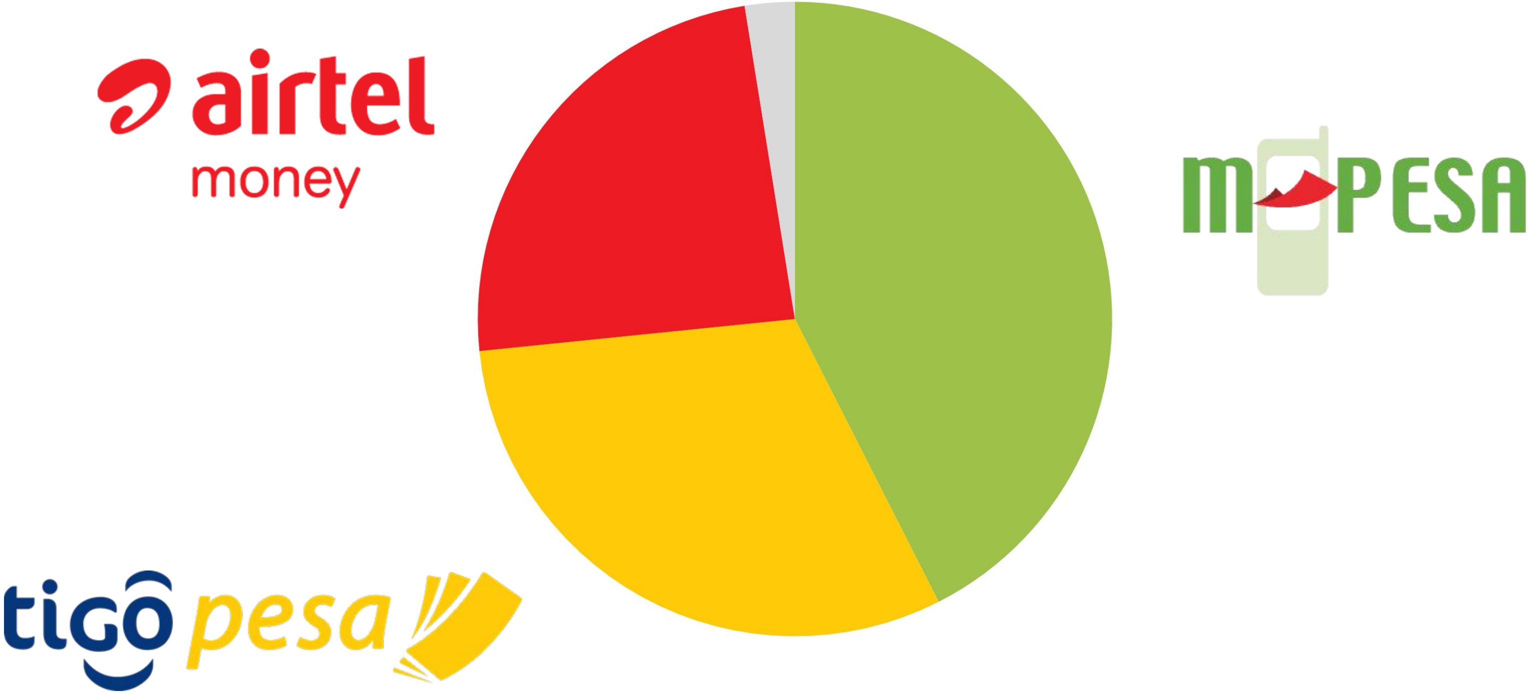
of Tanzanians
have a bank account

Source: NYU



of Tanzanians
have a mobile money account

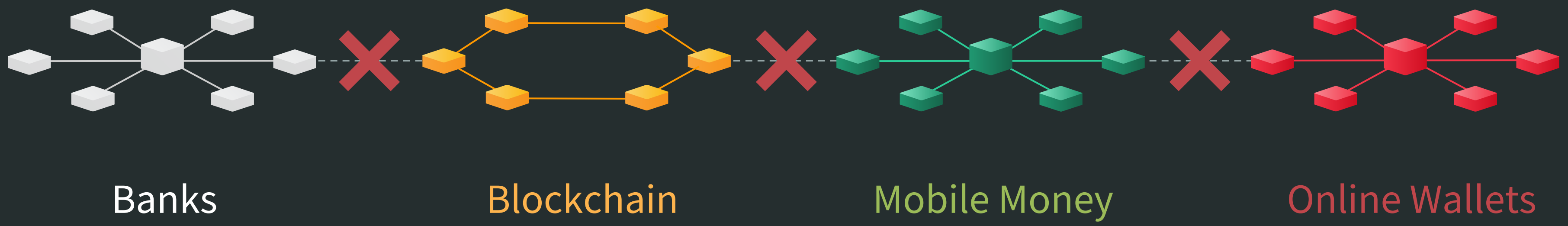
Source: GSMA



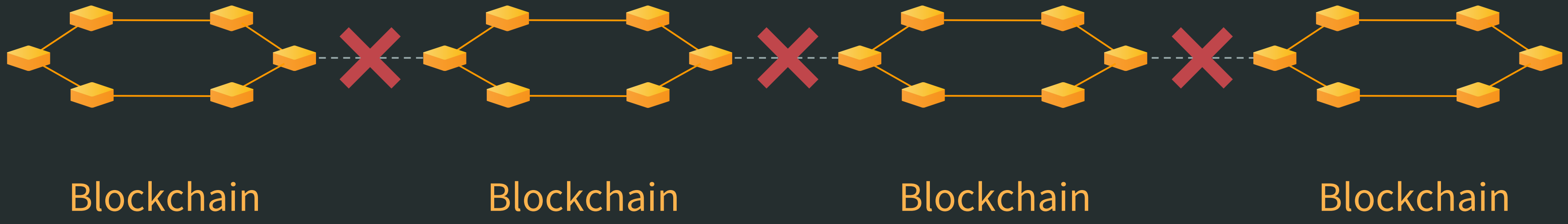
Source: GSMA

The Payment Space is Highly Fragmented

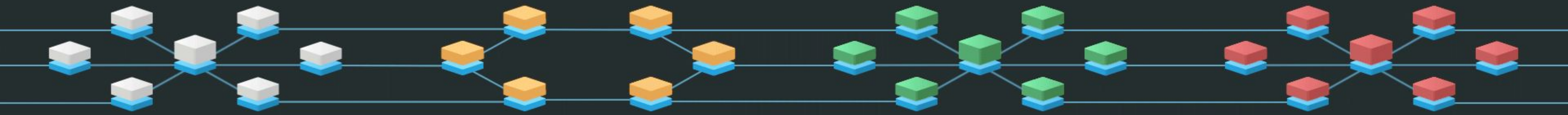
Payment Networks Are Disconnected



Blockchain Does Not Solve This Problem



Internetworking For Payment Networks

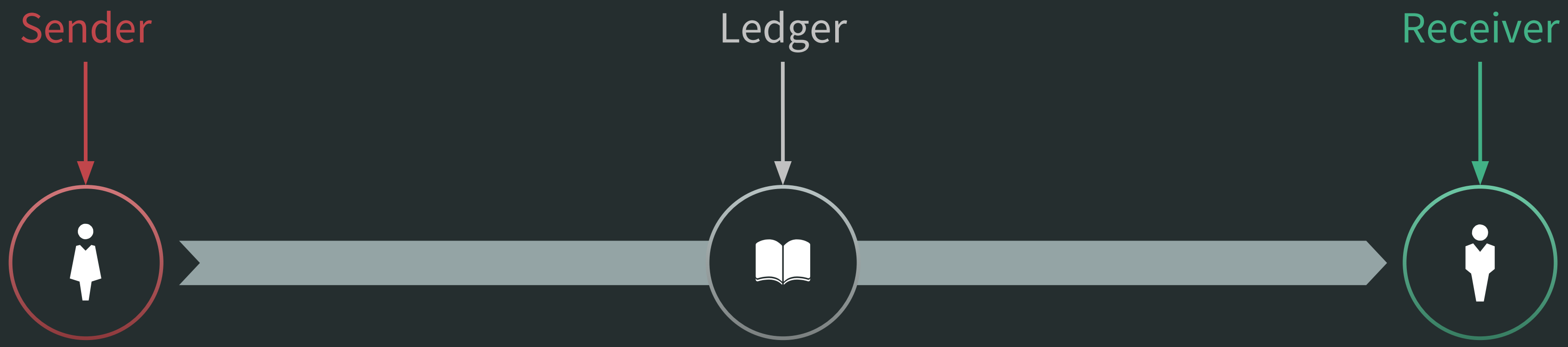


[Banks] [Blockchain] [Mobile Money] [Online Wallets]

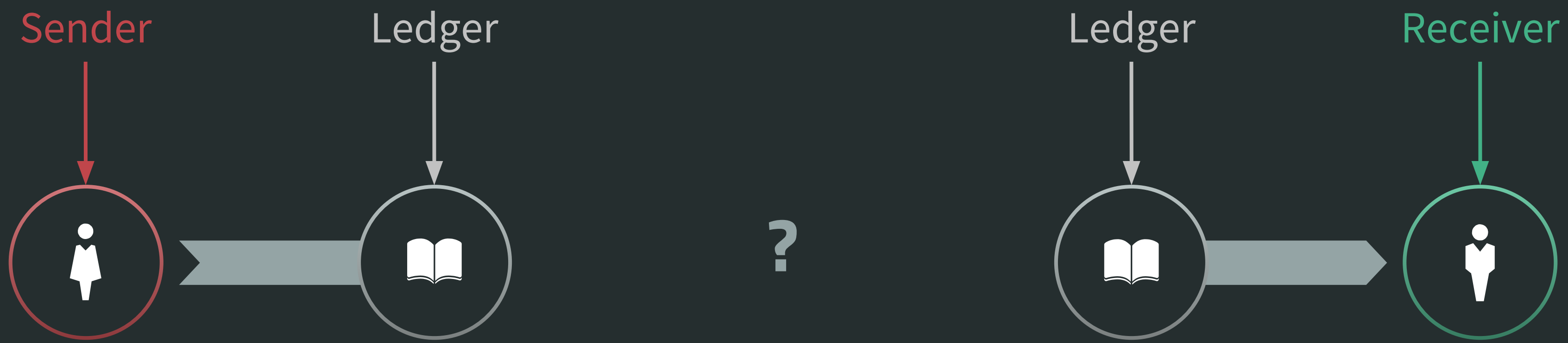
Interledger

Internetworking for Money

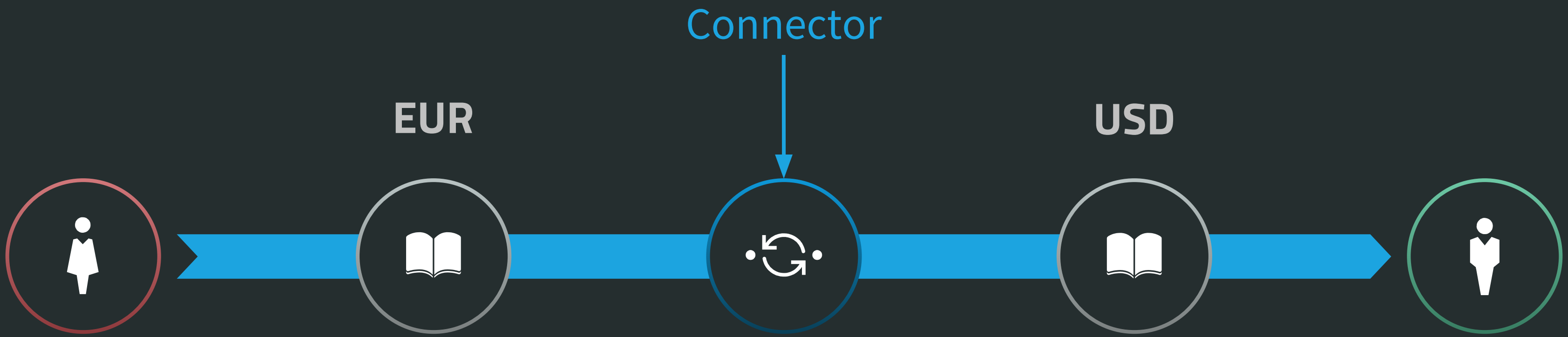
Payments Within One Network Are Trivial



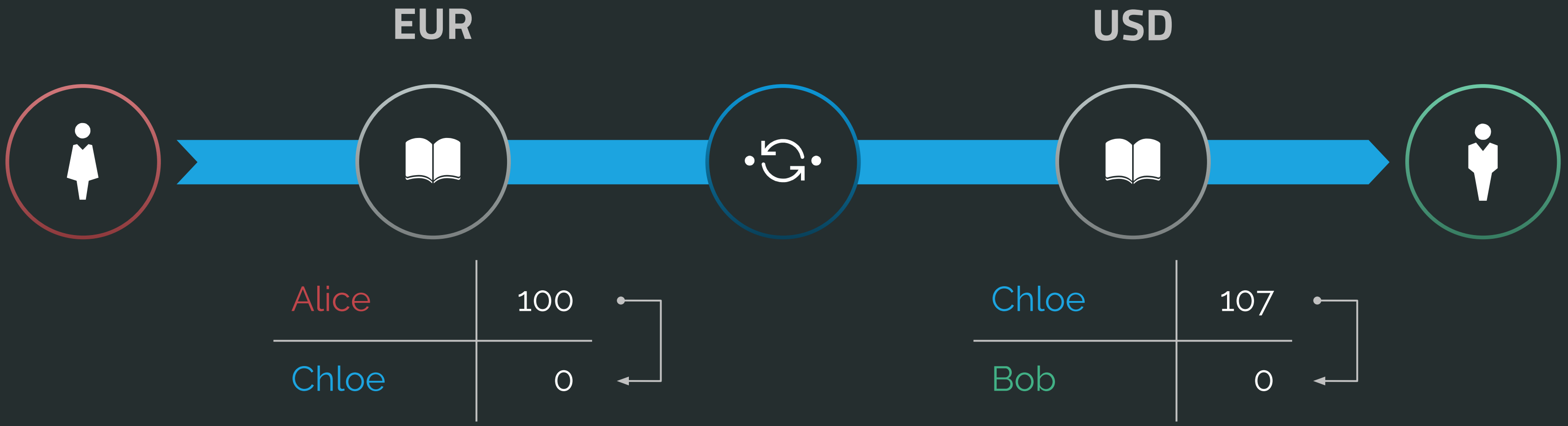
Payments Across Ledgers



Connectors Link Two Ledgers



Connectors Generate Revenue From Spreads



OUR INSPIRATION

The History & Architecture of the Internet

SIMPLICITY

Internet Architecture

Application	HTTP SMTP NNTP NTP RTP
Transport	TCP UDP
Internetwork	**IP**
Network	WIFI BLUETOOTH ETHERNET

Interledger Architecture

Application	SPSP HTTP-ILP PAYTORRENT
Transport	IPR PSK PSK-ECDH
Interledger	**ILP**
Ledger	BLOCKCHAINS BANKS MOBILE MONEY

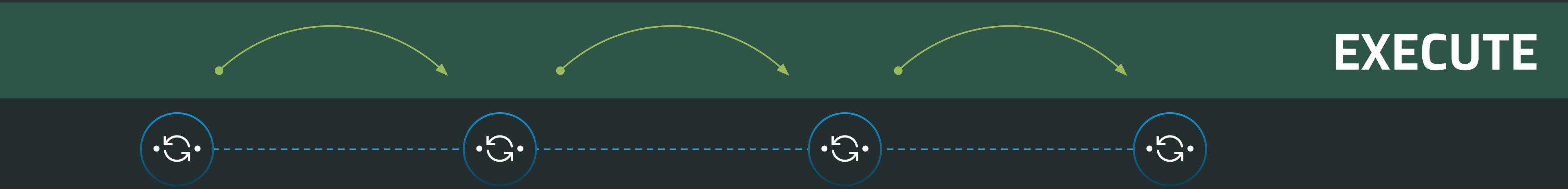
This Is Interledger

Amount

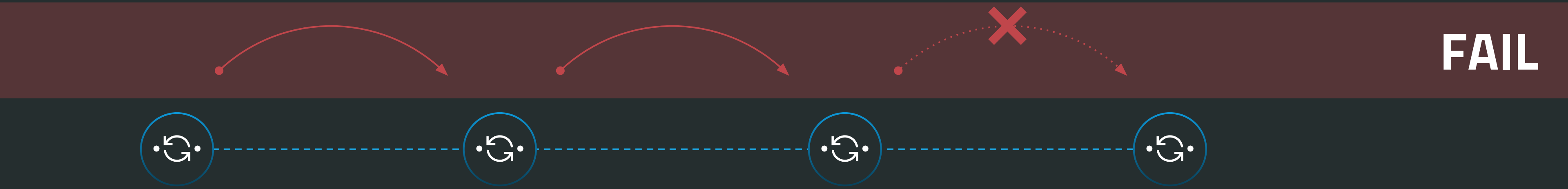
Destination

Data

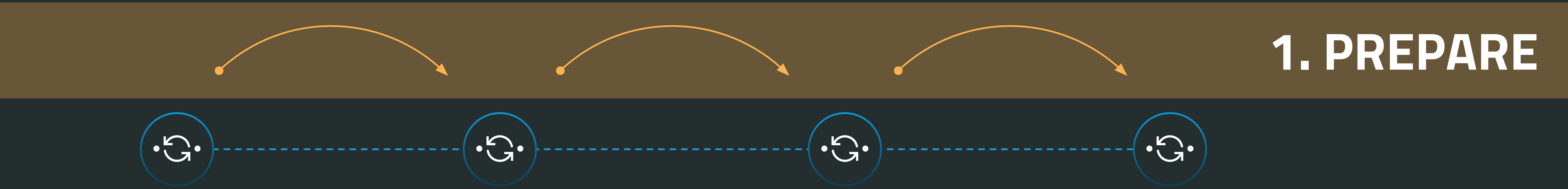
Optimistic Execution



Optimistic Execution



Interledger: Two-Phase Execution Secures Multi-Hop Transfers

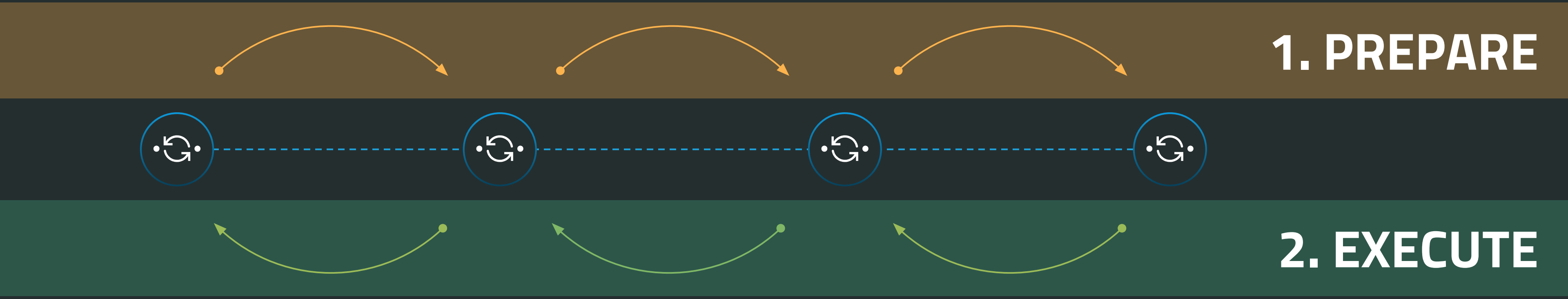


REFERENCES

J. Poon and T. Drya, *The Bitcoin Lightning Network: Scalable Off-Chain Instant Payments*, 2015

S. Thomas and E. Schwartz, *A Protocol for Interledger Payments*, 2015

Interledger: Two-Phase Execution Secures Multi-Hop Transfers



REFERENCES

J. Poon and T. Drya, *The Bitcoin Lightning Network: Scalable Off-Chain Instant Payments*, 2015

S. Thomas and E. Schwartz, *A Protocol for Interledger Payments*, 2015

This Is Interledger

Amount

Destination

Condition

Expiry

Data

This Is Interledger

unitless

Amount

Destination

Condition

Expiry

Data

This Is Interledger

Amount

unitless

integer

Destination

Condition

Expiry

Data

This Is Interledger

Amount

unitless

integer

ex. 1 140 000 000

Destination

Condition

Expiry

Data

This Is Interledger

hierarchical

unitless
integer
ex. 1140000000

Amount
Destination
Condition
Expiry
Data

This Is Interledger

hierarchical
dot-separated

Amount
Destination
Condition
Expiry
Data

unitless
integer
ex. 1 140 000 000

This Is Interledger

hierarchical
dot-separated
ex. g.crypto.xrp.r123

Amount
Destination
Condition
Expiry
Data

unitless
integer
ex. 1 140 000 000

This Is Interledger

hierarchical
dot-separated
ex. g.crypto.xrp.r123

Amount
Destination
Condition
Expiry
Data

unitless
integer
ex. 1140000000

hashlock

This Is Interledger

hierarchical
dot-separated
ex. g.crypto.xrp.r123

Amount
Destination
Condition
Expiry
Data

unitless
integer
ex. 1140000000

hashlock
sha256
ex. jBpj1tiDifolxBQ

This Is Interledger

Amount

unitless

integer

ex. 1140000000

Destination

hierarchical

dot-separated

ex. g.crypto.xrp.r123

Condition

hashlock

sha256

ex. jBpj1tiDifolxBQ

Expiry

date

iso-8601

ex. 2017-11-07T7:11:17Z

Data

This Is Interledger

hierarchical
dot-separated
ex. g.crypto.xrp.r123

Amount
Destination
Condition
Expiry
Data

unitless
integer
ex. 1140000000

hashlock
sha256
ex. jBpj1tiDifolxBQ

date
iso-8601
ex. 2017-11-07T7:11:17Z

This Is Interledger

Amount
- unitless
- integer
- ex. 1140000000

Destination
- hierarchical
- dot-separated
- ex. g.crypto.xrp.r123

Condition
- hashlock
- sha256
- ex. jBpj1tiDifolxBQ

Expiry
- date
- iso-8601
- ex. 2017-11-07T7:11:17Z

Data
- application data
- json, binary, etc.

What Does a Connector Do?

1 140 000 000	Amount
g.crypto.xrp.r123	Destination
jBpj1tiDif0lxBQ	Condition
2017-11-07T7:11:17Z	Expiry
{ tx_type: "p2p", ...}	Data

What Does a Connector Do?

USD	Exchange Rate	EUR
1 140 000 000	Amount	1 320 000 000
g.crypto.xrp.r123	Destination	
jBpj1tiDif0lxBQ	Condition	
2017-11-07T7:11:17Z	Expiry	
{ tx_type: “p2p”, ...}	Data	

What Does a Connector Do?

Exchange Rate & Spread →

1 140 000 000	Amount	1 300 000 000
g.crypto.xrp.r123	Destination	
jBpj1tiDif0IxBQ	Condition	
2017-11-07T7:11:17Z	Expiry	
{ tx_type: "p2p", ...}	Data	

What Does a Connector Do?

Copy & Route

1 140 000 000	Amount	1 300 000 000
g.crypto.xrp.r123	Destination	g.crypto.xrp.r123
jBpj1tiDif0IxBQ	Condition	
2017-11-07T7:11:17Z	Expiry	
{ tx_type: “p2p”, ...}	Data	

What Does a Connector Do?

Copy →

1 140 000 000	Amount	1 300 000 000
g.crypto.xrp.r123	Destination	g.crypto.xrp.r123
jBpj1tiDif0IxBQ	Condition	jBpj1tiDif0IxBQ
2017-11-07T7:11:17Z	Expiry	
{ tx_type: “p2p”, ...}	Data	

What Does a Connector Do?

Subtract Delay

1 140 000 000	Amount	1 300 000 000
g.crypto.xrp.r123	Destination	g.crypto.xrp.r123
jBpj1tiDif0lxBQ	Condition	jBpj1tiDif0lxBQ
2017-11-07T7:11:17Z	Expiry	2017-11-07T7:11:1**6**Z
{ tx_type: “p2p”, ...}	Data	

What Does a Connector Do?

Copy →

1 140 000 000	Amount	1 300 000 000
g.crypto.xrp.r123	Destination	g.crypto.xrp.r123
jBpj1tiDif0lxBQ	Condition	jBpj1tiDif0lxBQ
2017-11-07T7:11:17Z	Expiry	2017-11-07T7:11:16Z{
{ tx_type: “p2p”, ...}	Data	tx_type: “p2p”, ...}

What Does a Connector Do?

1 140 000 000	Amount	1 300 000 000
g.crypto.xrp.r123	Destination	g.crypto.xrp.r123
jBpj1tiDif0lxBQ	Condition	jBpj1tiDif0lxBQ
2017-11-07T7:11:17Z	Expiry	2017-11-07T7:11:16Z{
{ tx_type: “p2p”, ...}	Data	tx_type: “p2p”, ...}

How to Get Adoption?

Adoption Strategy

ILP

Adoption Strategy

ILP

Digital assets
e.g. XRP, Ethereum

Adoption Strategy

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Adoption Strategy

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Mobile Money
e.g. Mojaloop

Adoption Strategy

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Mobile Money
e.g. Mojaloop

Banks
e.g. Ripple

Adoption Strategy

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Mobile Money
e.g. Mojaloop

Banks
e.g. Ripple

Central Banks
e.g. Bank of England

Adoption Strategy

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Mobile Money
e.g. Mojaloop

Banks
e.g. Ripple

Central Banks
e.g. Bank of England

Online wallets

Adoption Strategy

Micropayments
e.g. Unhash, Codius

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Mobile Money
e.g. Mojaloop

Banks
e.g. Ripple

Central Banks
e.g. Bank of England

Online wallets

Adoption Strategy

Micropayments
e.g. Unhash, Codius

Web Payments

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Mobile Money
e.g. Mojaloop

Banks
e.g. Ripple

Central Banks
e.g. Bank of England

Online wallets

Adoption Strategy

Micropayments
e.g. Unhash, Codius

Web Payments

Marketplaces

ILP

Digital assets
e.g. XRP, Ethereum

Blockchain
e.g. Hyperledger Quilt

Mobile Money
e.g. Mojaloop

Banks
e.g. Ripple

Central Banks
e.g. Bank of England

Online wallets

Q&A

Please join the CG

Adrian Hope-Bailie
@ahopebailie

https://interledger.org