



**BIS** Innovation  
Hub

# Nexus

A blueprint for instant cross-border payments

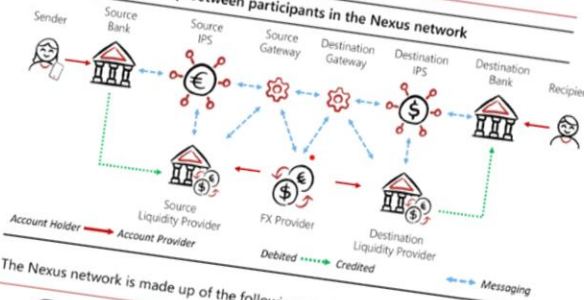
# Nexus

A blueprint for instant cross-border payments



## Participants in the Nexus network

Figure 3: Relationship between participants in the Nexus network



The Nexus network is made up of the following participants and actors:



### Sender & Recipient

The Sender and Recipient can be individuals or small or medium-sized businesses who currently use IPSs to send domestic payments – so-called “retail” payments. Since most IPSs place used to make payments between very large corporates or financial institutions, so-called “wholesale” payments.



### Instant payment

IPSOs provide infrastructure to make instant domestic payments in the same country.



### Source Bank & Destination Bank

The Sender and Recipient will be banks and Service Providers (PSPs). The Source Bank is the Sender's bank, and the Destination Bank is the Recipient's bank. In most cases, all payments flow through it.



### The Nexus Gateway

To connect the IPSs together, the Nexus Gateway. The Nexus Gateway processes such as compliance and the sequencing of payments. The Gateway connects to the Destination IPS and to Nexus Gateways in other countries.

Report and technical docs available at [nexus.bisih.org](https://nexus.bisih.org)

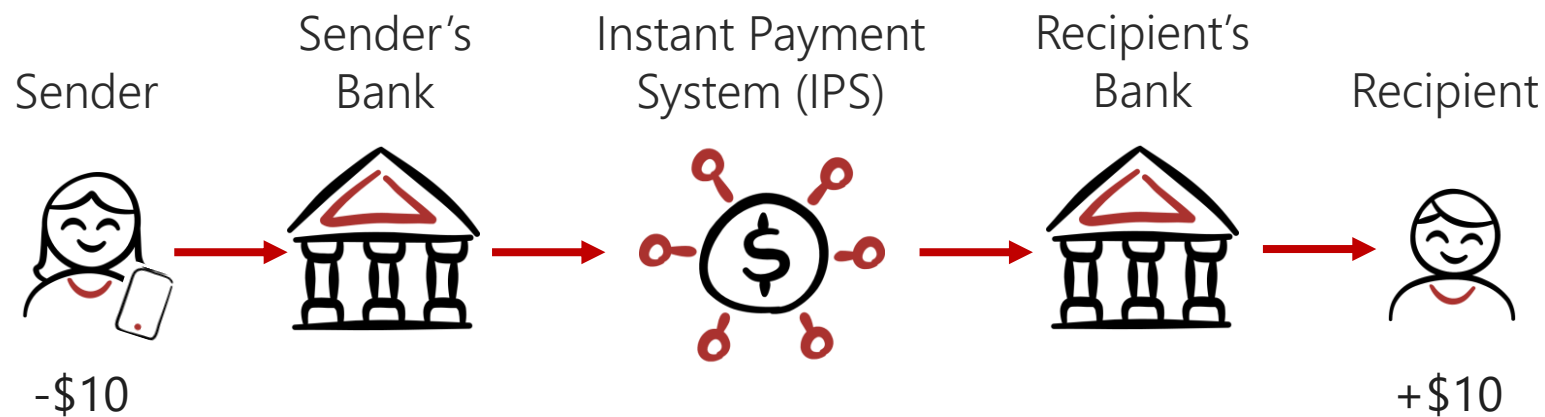
# Overview

Linking instant payment systems could enable cross-border payments in less than 60 seconds.

# Instant Payment Systems

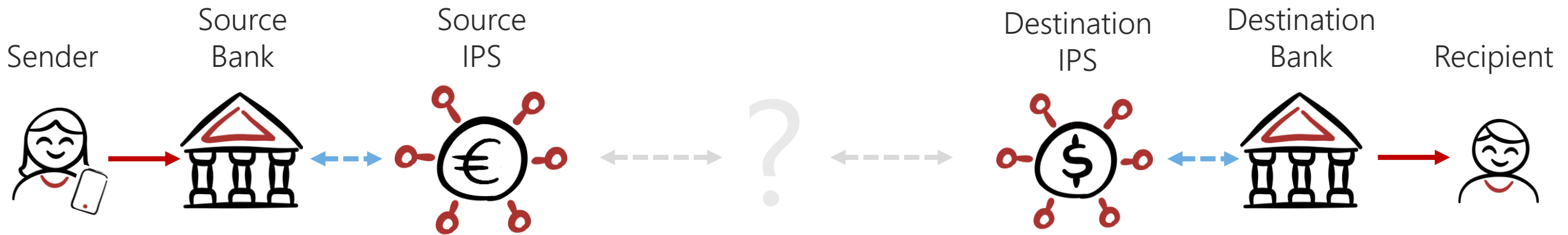
---

- Connect multiple banks (and some non-bank payment service providers)
- Process domestic **account-to-account** payments
- Between individuals & businesses
- High volume, low value
- Live in 60 countries, under development in more



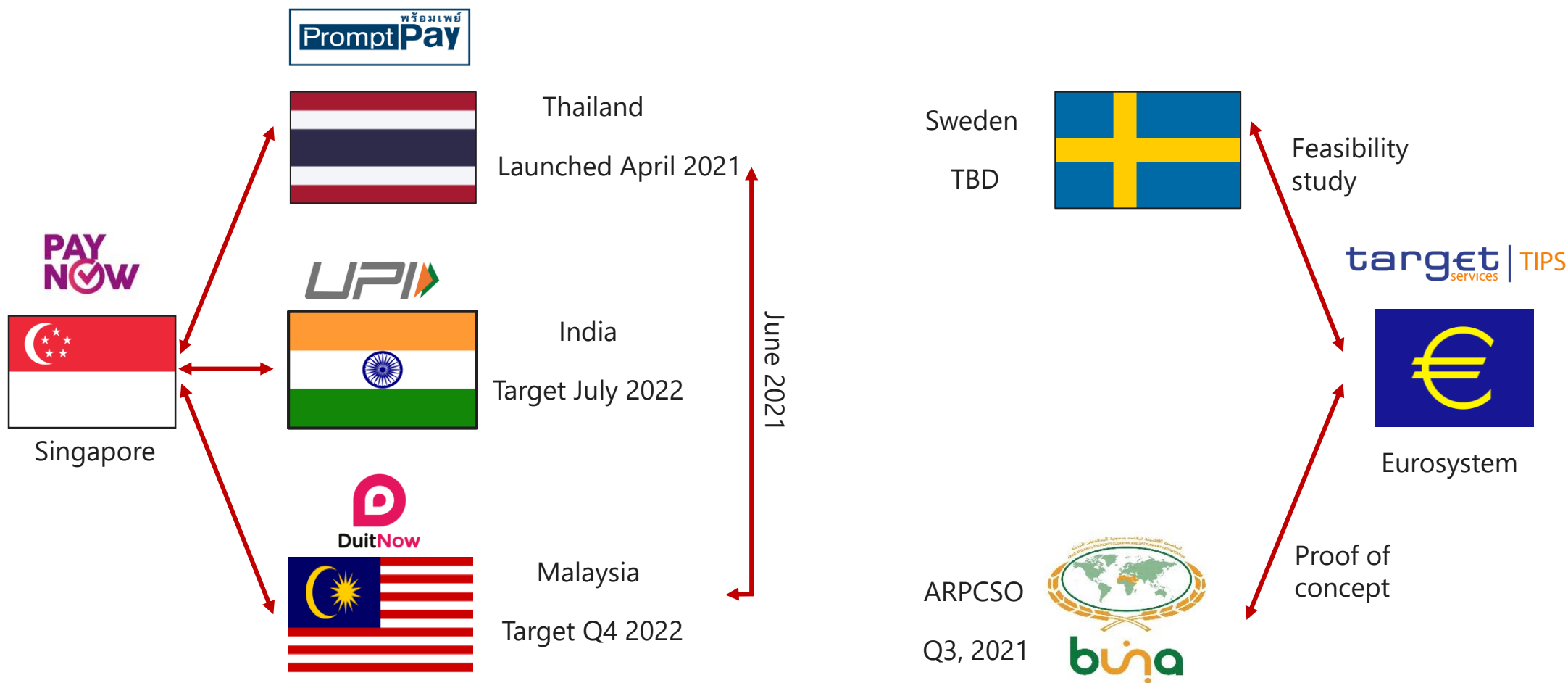
# Connecting Instant Payment Systems

Could we provide near-instant cross-border payments?



# Instant payment systems can be linked

...enabling end-to-end payments in as little as 60 seconds



# Benefits of linking IPSs

---



## Speed

Most domestic payments within 30 seconds  
Could provide cross-border payments <60s

24/7/365 operation (unlike RTGS)



## Cost

Shorter transaction chains = lower cost  
base for cross-border payments

Modern infrastructure (<10 years old) less  
costly to adapt



## Transparency & certainty

Fees can be calculated up front

Payments complete or fail with certainty



## Access

Existing network: Open to most banks  
and some non-bank Payment Service  
Providers.

Senders can use existing bank/PSP, and  
existing apps



## Safety and security

Build on strong risk management  
in domestic regimes

# Obstacles to linking IPSs

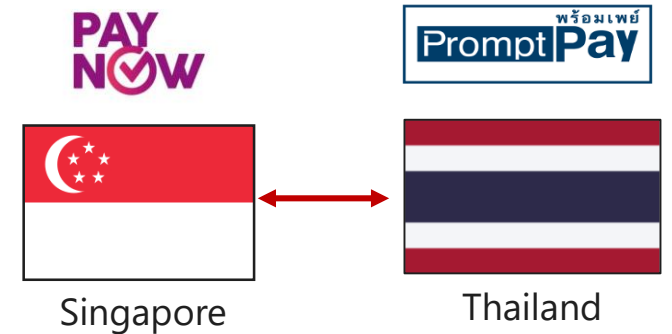
---

Existing projects build country-to-country (bilateral) links.

Need to overcome differences between IPS designs:

- **data formats**, standards and mandatory fields
- **processes** and the sequence of steps in a payment process;
- **scheme rules** around liability, disputes, data protection and privacy
- **functionality**, including whether aliases are used and whether there is a confirmation of payee service.

One integration is hard (Singapore-Thailand link around 18 months).

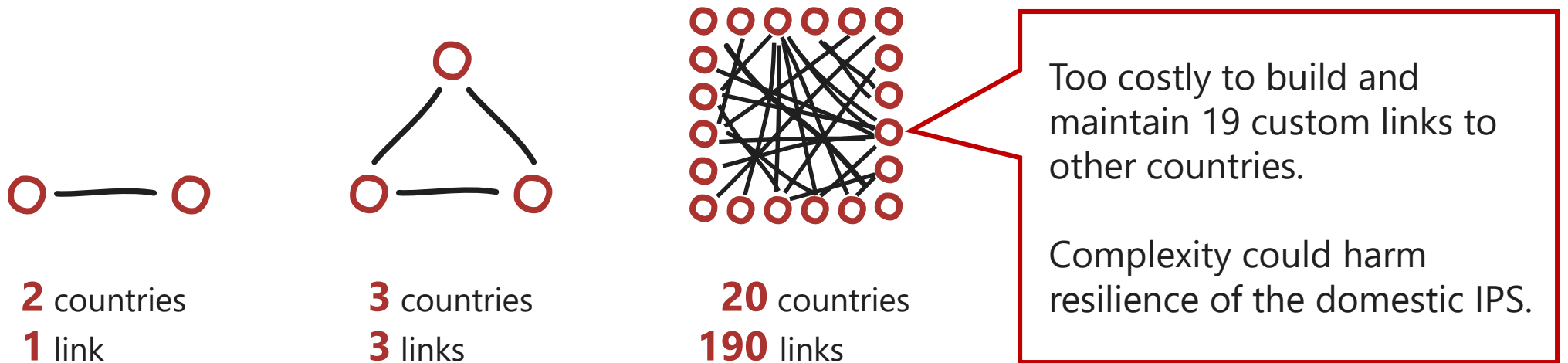




# Obstacles to linking IPSs

---

It gets harder and more complex as the network scales:

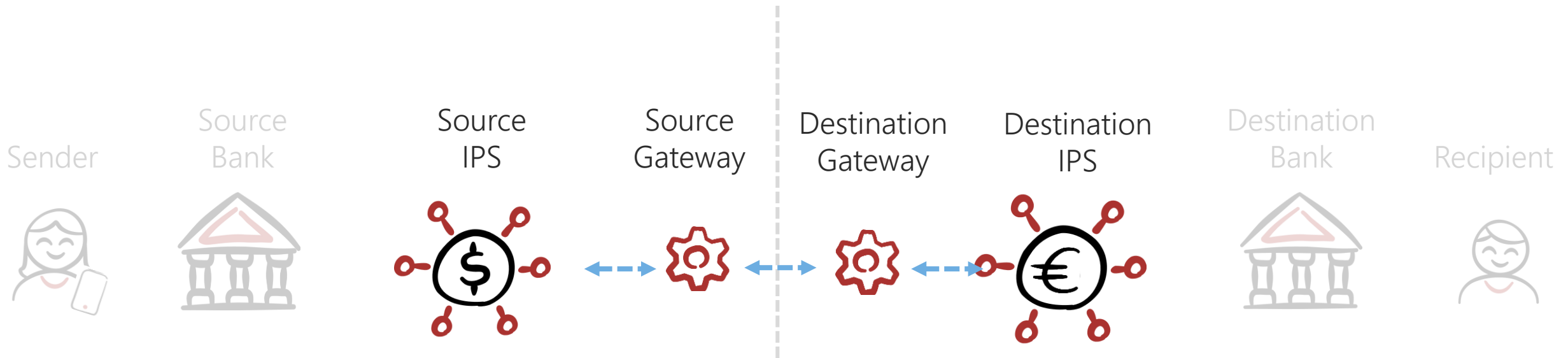


Difficult to scale to a global cross-border network using bilateral links.

How Nexus addresses the scalability challenge  
Nexus standardizes the way IPSs speak to each other

# Nexus would **standardize** the way that IPSs communicate

---



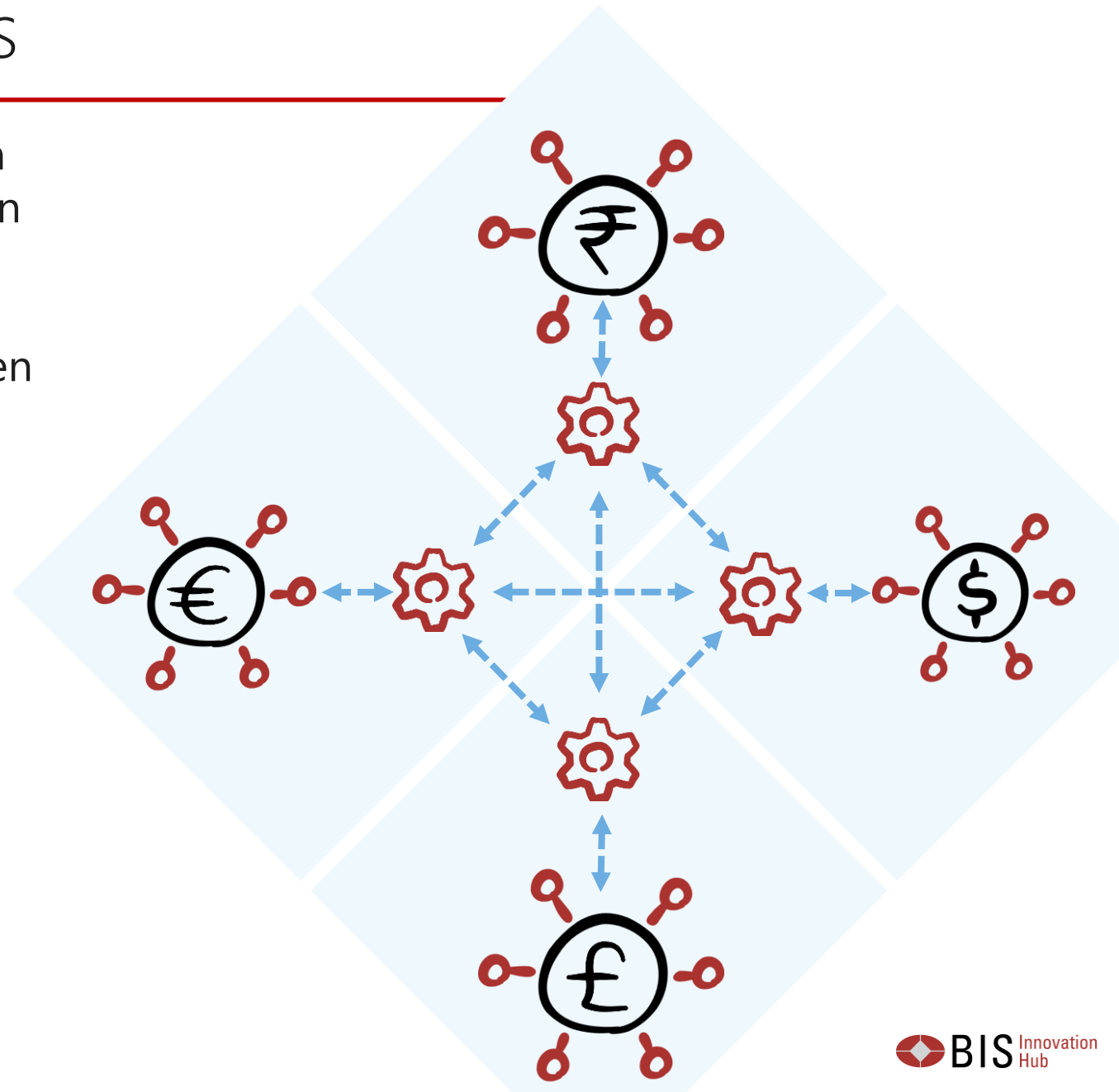
1. Each IPS runs a Nexus Gateway
2. Domestic payments infrastructure is linked to the local Nexus Gateway
3. Nexus Gateways speak to each other across borders

# Nexus connects multiple IPSs

---

Each IPS integrates **once**, to Nexus, and can then route payments to any other country in the network.

Nexus **averages out** the complexity between IPSs.



# Key functions of Nexus

---



## FX Conversion

Coordinate with FX Provider(s) to identify and lock-in best FX rate



## Support Compliance

Allow Source Bank & Destination Bank to coordinate on sanctions screening

Help to resolve false matches without manual intervention



## Messaging

Translate between messaging standards

Coordinates process across 2 IPSs and handle failures



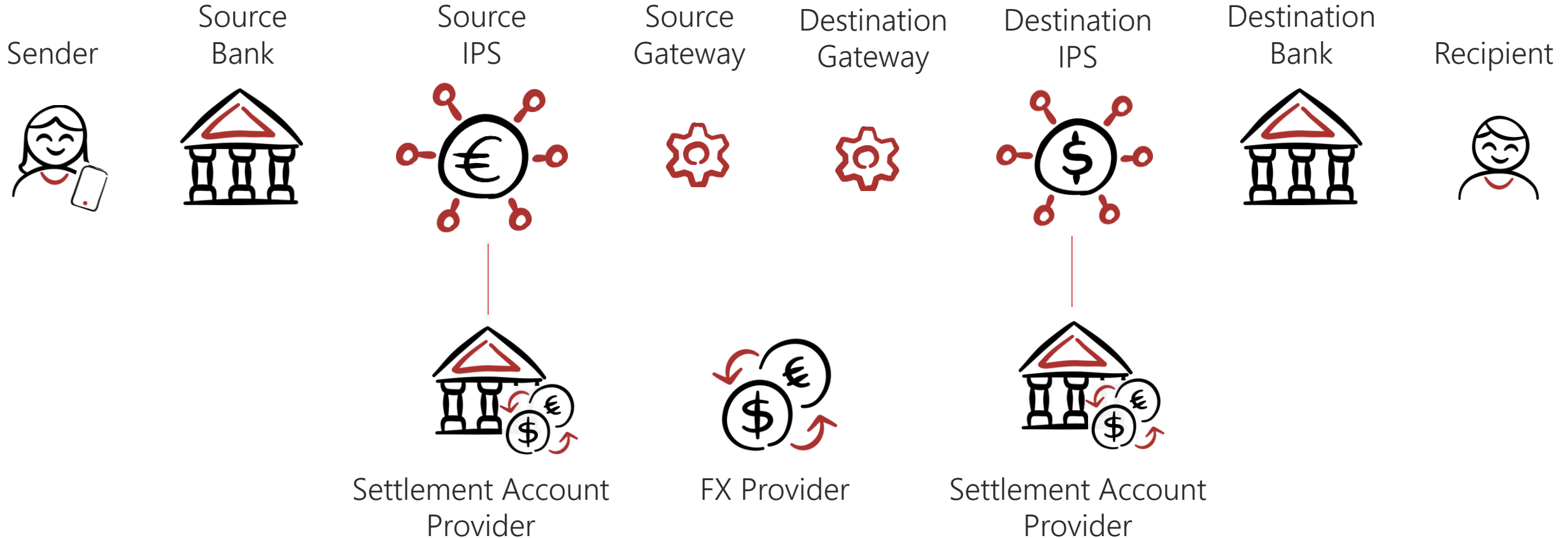
## Settlement

Relies on existing IPS settlement cycles

No reliance on RTGS

# Participants in a Nexus payment

---

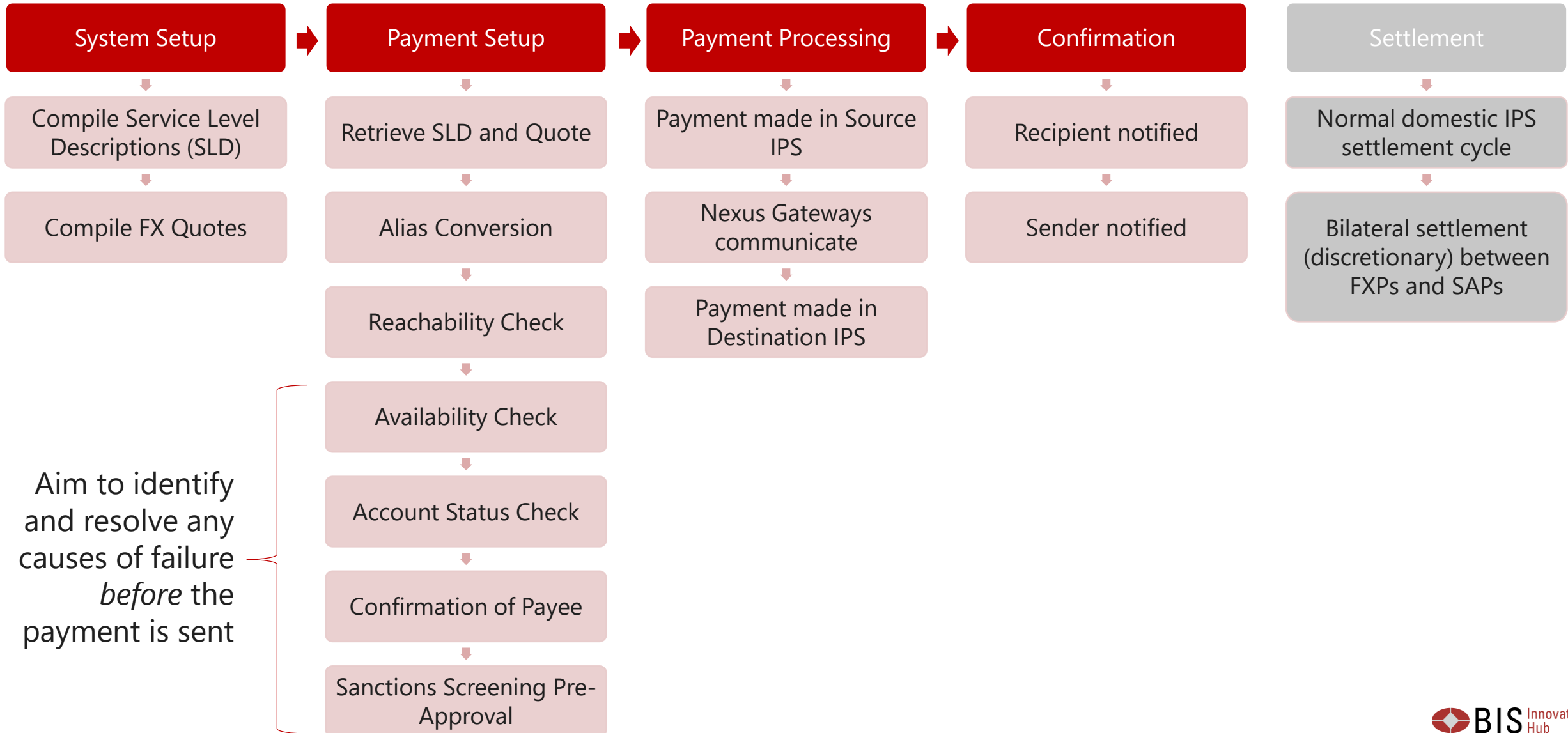


If the FX Provider is **not** a member of either IPS, it can use accounts it holds with banks who *are* members. These are Settlement Account Providers.

# Example Payment through Nexus

Sending 100 Singapore dollars to Euros

# Overall Flow





# Payment Setup

# Sender chooses country

---

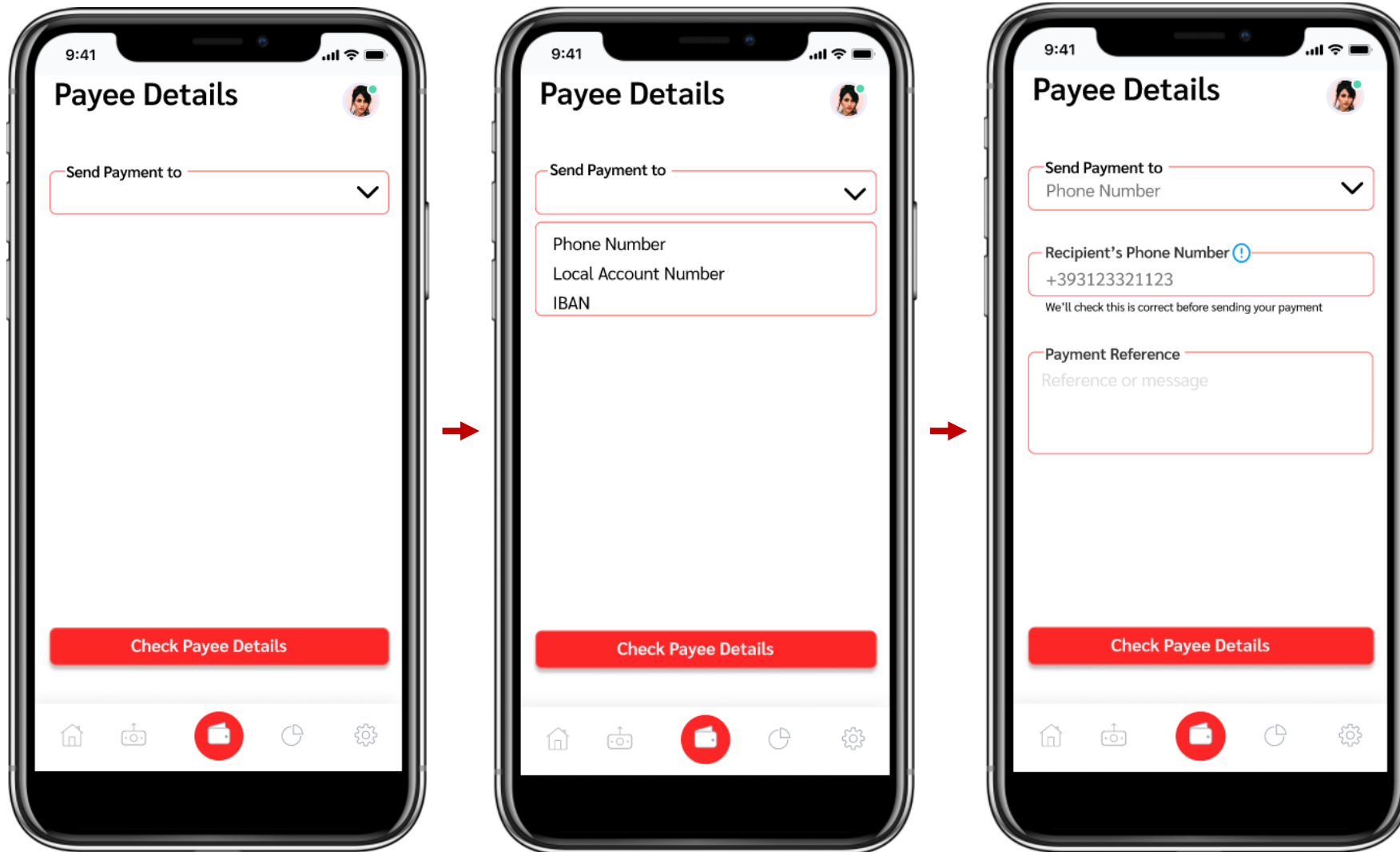
(Mockup of a bank's existing app)



- Uses existing banking app or channels
- (No dedicated app for Nexus or Nexus ID)

1. Sender selects country

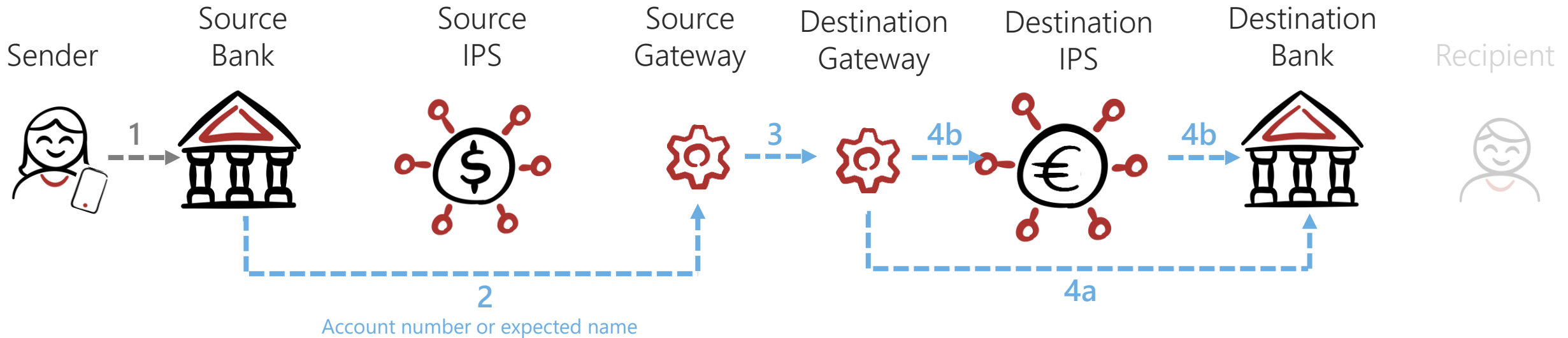
# Sender adds recipient details



- Sender can choose any alias or account format that is accepted in the Destination Country

# Confirmation of Payee

GET /payees/{destination\_country}



Three models:

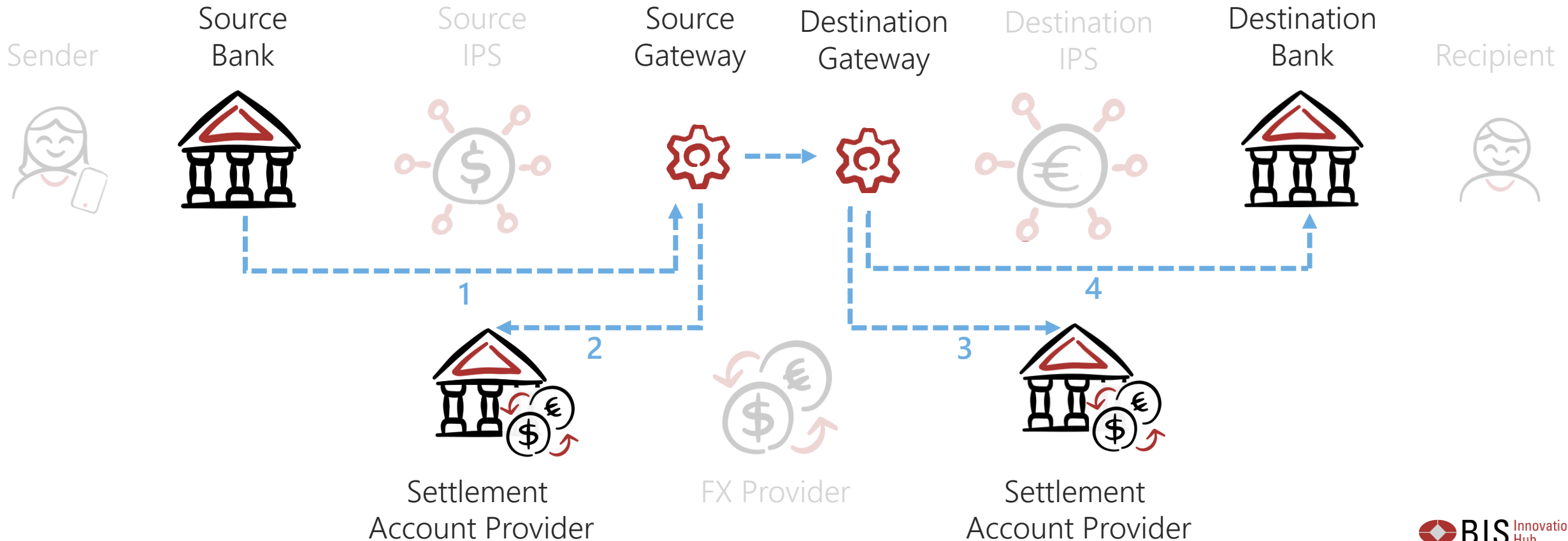
1. Real Name: Destination Bank returns real name on the account (maybe partially masked)
2. User-defined Nickname is returned
3. Comparison: Compare expected name to real name on account. Return match status (exact, near, none)

# Sanctions Screening Pre-Approval

GET /preapprovals/

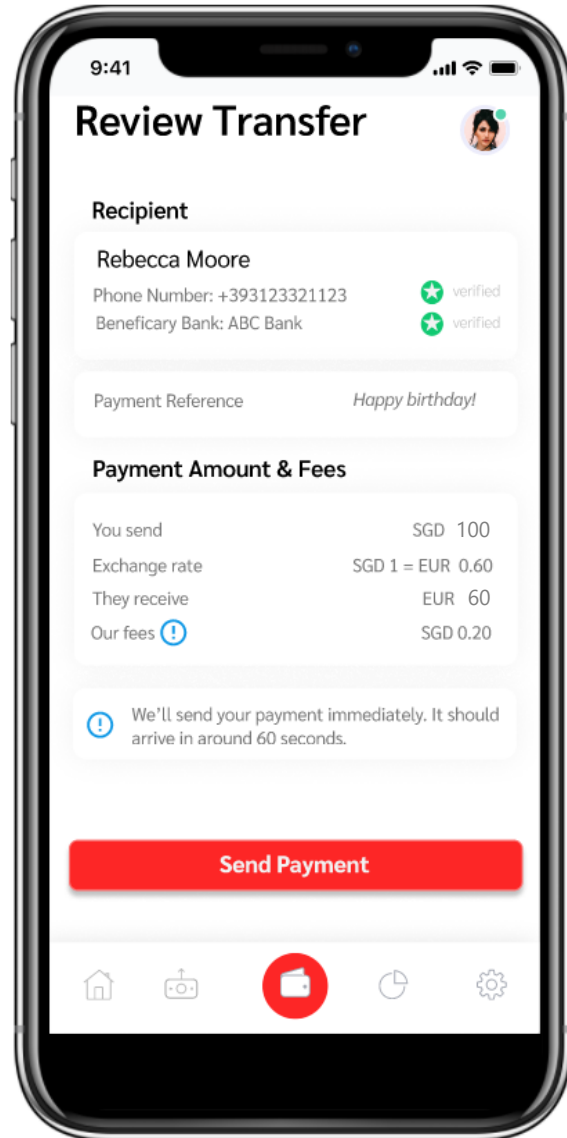
Returns:

- "Payment good to go" OR
- "Please add X additional information to the final payment instruction"



# Sender checks recipient & sends payment

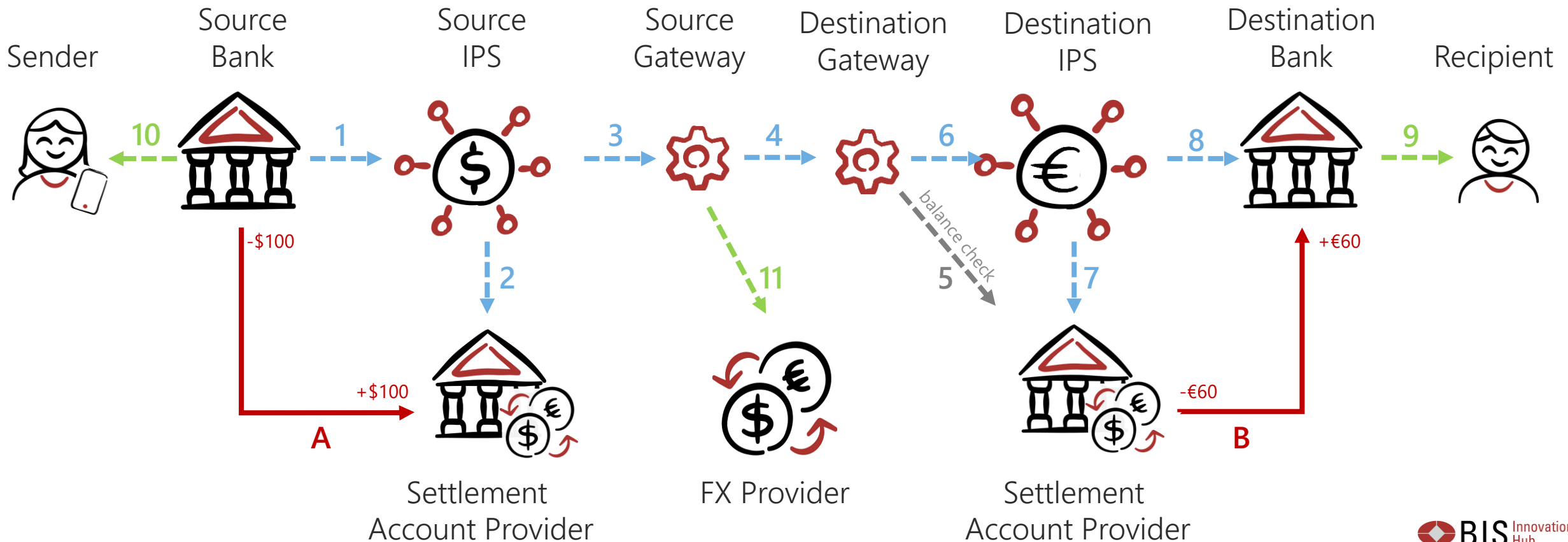
---



- Recipient name is confirmed through communication with the Destination Bank
- Sender is shown all details and fees before confirming the payment

# Payment Processing

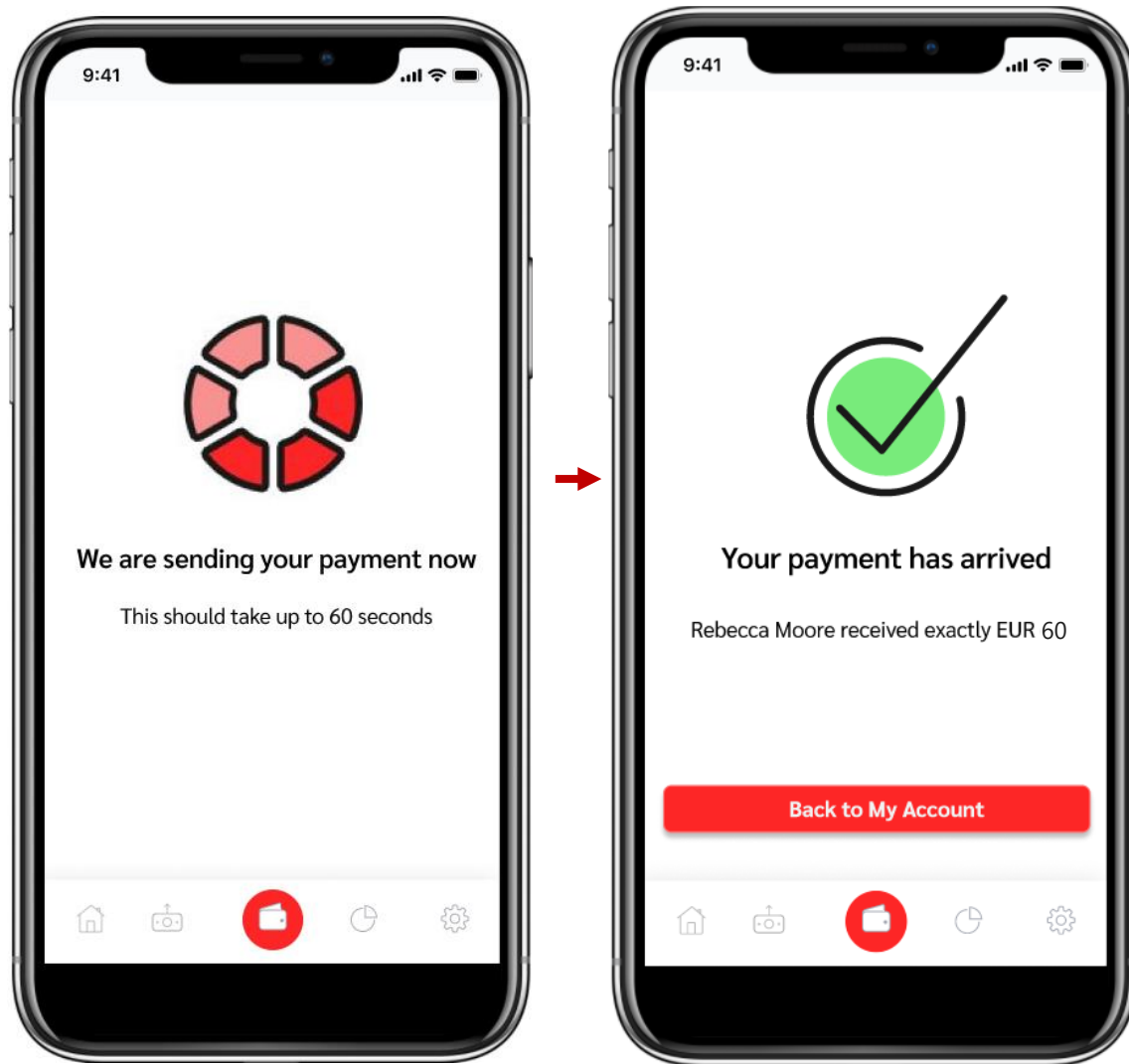
# Final Payment Instruction





# Payment is confirmed

---



- Payment completes (or fails) in less than 60 seconds (in most cases)
- If payment fails, Sender is informed immediately.

# Risk Model

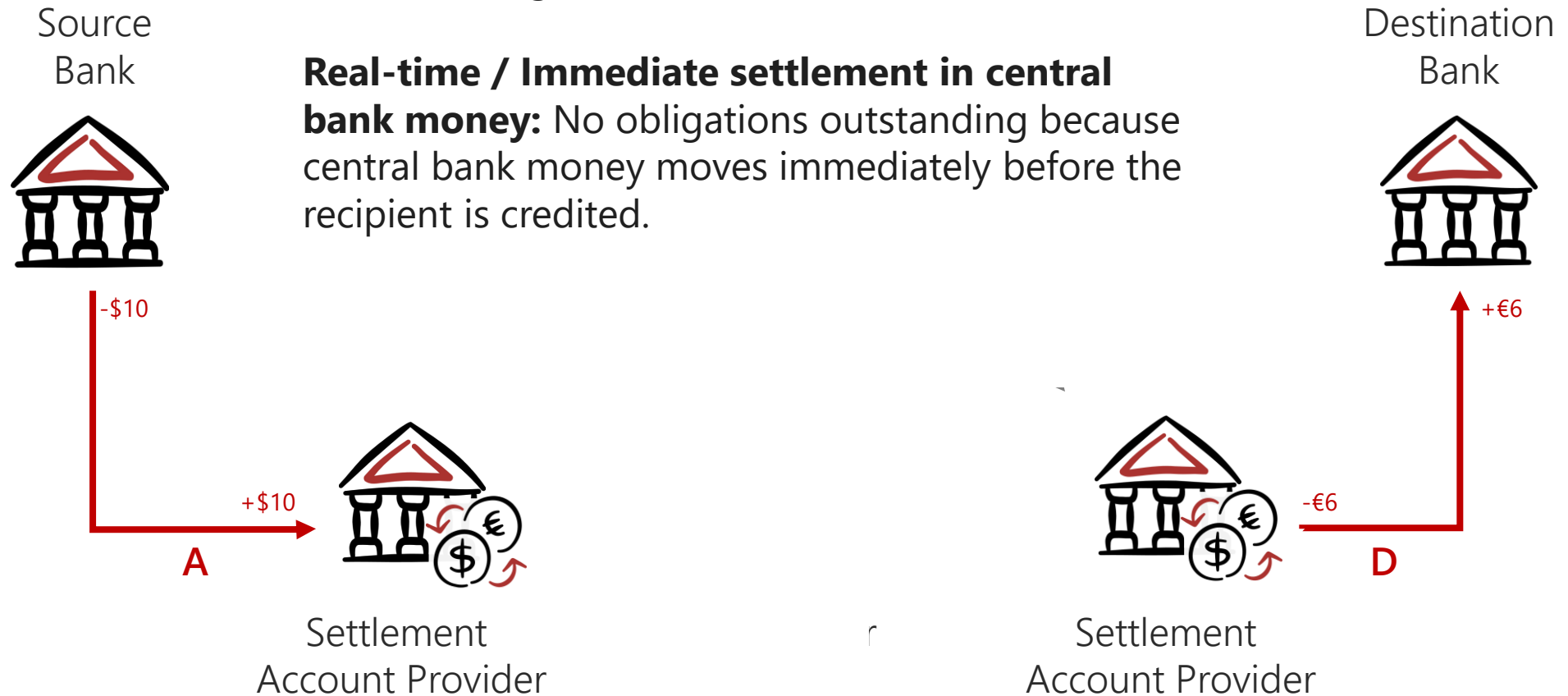
---

## Deferred Net Settlement (DNS) models:

Obligations are backed by pre-funding or collateral within existing domestic IPS scheme

## Real-time / Immediate settlement in central bank money:

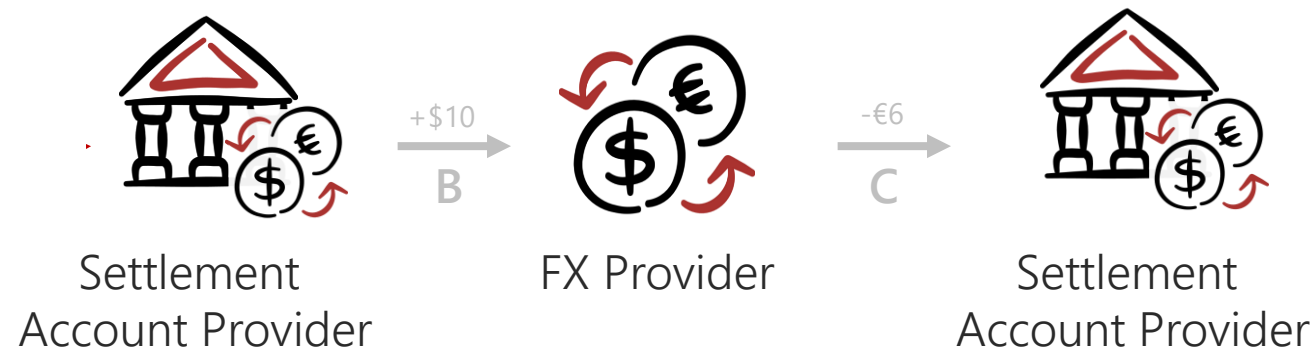
No obligations outstanding because central bank money moves immediately before the recipient is credited.



# Risk Model

---

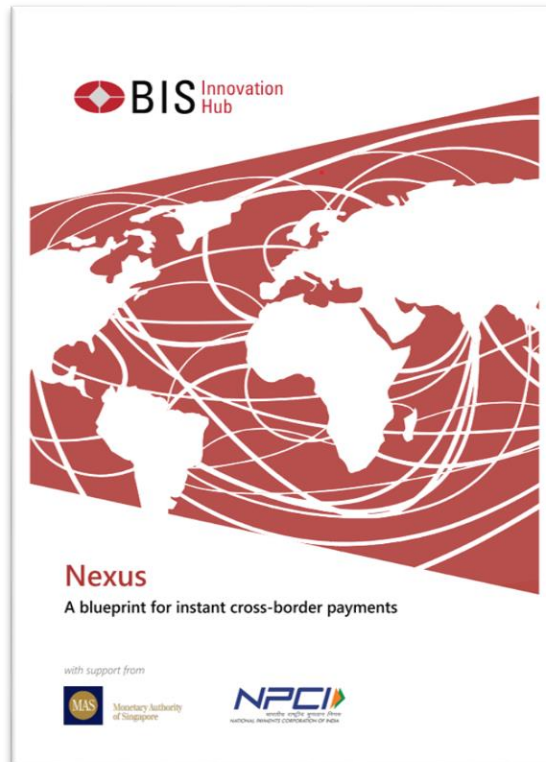
- **FX Provider has an exposure to the Source Settlement Account Provider (SAP)** (where it holds an account)
- FX Provider has an exposure to the Destination SAP, as it needs to pre-fund its Destination SAP account BEFORE it can make payments
- SAPs do not have a credit risk exposure to the FX Provider
- Failure of the FX Provider does not impact any other bank or the payment chain.





# Next Steps

# Blueprint published



## Short Report (20 pages)

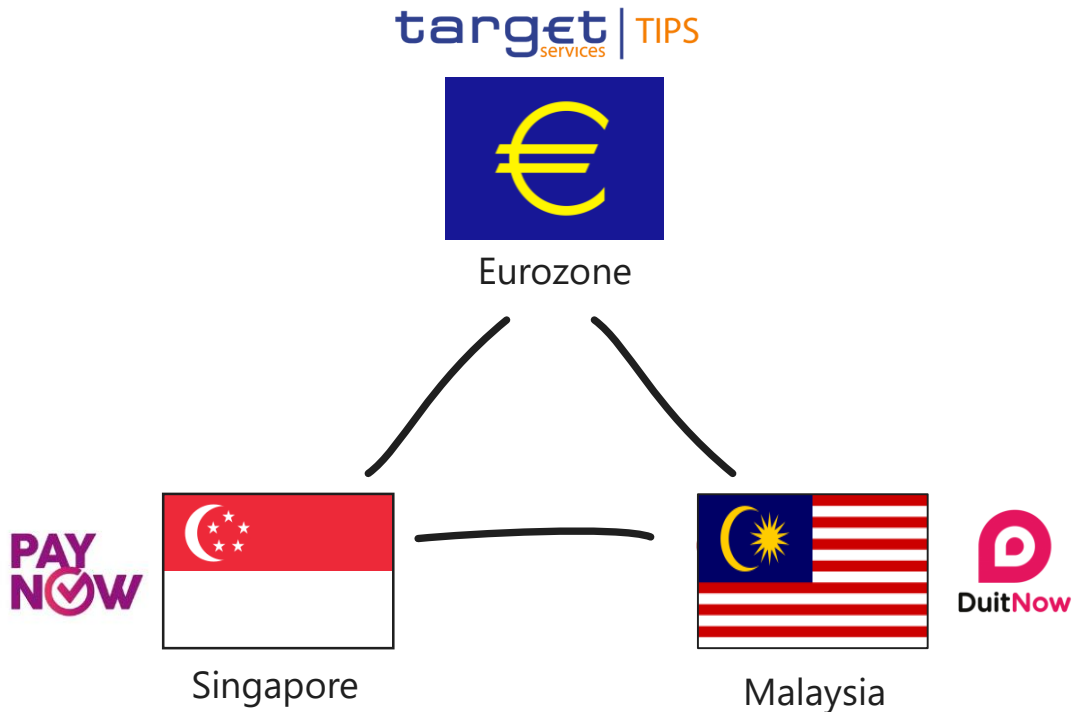
<https://www.bis.org/publ/othp39.htm>

The image shows two overlapping screenshots of the BIS Innovation Hub website. The top screenshot displays the 'Nexus Overview' page, which includes a navigation menu on the left with sections like 'Nexus Overview', 'Terminology & Acronyms', 'PARTICIPANTS', 'USER EXPERIENCE', and 'AN END-TO-END PAYMENT THROUGH NEXUS'. The main content area features the heading 'Nexus Overview' and a sub-heading 'Nexus is a blueprint for instant cross-border payments'. Below this, it states 'Around 60 countries now have instant payment systems, which allow payments between bank accounts in just seconds. Connected easier to access and more...'. It also mentions 'This is a project by the European Central Bank, the Monetary Authority of Singapore, and the National Payments Corporation of India, and how we can build on the existing infrastructure.' and 'This project provides a framework to connect IPSs in multiple countries to a single destination within 60 seconds.' The bottom section is titled '3 Minute Overview' and includes a video thumbnail with the text 'How to make a cross-border payment'. The bottom screenshot shows the 'Quote API' page, which details the 'Update Quote (FXP to Local Nexus Gateway)' endpoint. It specifies the method as 'POST /v1/quote/{source\_currency}/{destination\_currency}' and lists path parameters: 'Source Currency' (String, Mandatory, From Currency) and 'Destination Currency' (String, Mandatory, To Currency). It also shows the 'Request Body' table with 'Source Liquidity Provider' (String, Mandatory, Liquidity Provider in the Source IPS).

## Technical Docs, Message Flows, API Specifications

[nexus.bisih.org](https://nexus.bisih.org)

# Technical Proof-of-Concept



## Outputs

1. Working software for the **Nexus Gateways** (not production grade)
2. Comprehensive and tested **technical blueprint** with detailed **API specifications**
3. A first complete **draft of a viable Nexus scheme** (in plain English and with no specific jurisdiction selected)



Monetary Authority  
of Singapore

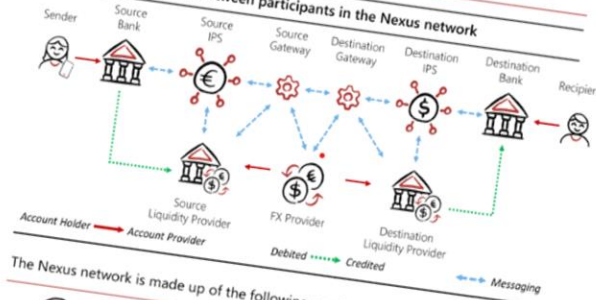
# Nexus

A blueprint for instant cross-border payments



## Participants in the Nexus network

Figure 3: Relationship between participants in the Nexus network



The Nexus network is made up of the following participants and actors:



### Sender & Recipient

The Sender and Recipient can be individuals or small or medium-sized businesses who currently use IPSs to send domestic payments – so-called “retail” payments. Since most IPSs place caps on the size of single payments, Nexus is not designed to be used to make payments between very large corporates or financial institutions, so-called “wholesale” payments.



### Instant payment systems

IPSOs provide infrastructure to make instant domestic payments in the same country.



### Source Bank & Destination Bank

The Sender and Recipient will be banks and Service Providers (SPs). The Source Bank is the Sender's bank, and the Destination Bank is the Recipient's bank. In most cases, all payments are routed through it.



### The Nexus Gateway

To connect the IPSs together, the Nexus Gateway. The Nexus Gateway processes such as compliance and the sequencing of payments. The Gateway connects to the destination bank and to Nexus Gateways in other countries.

Report and technical docs available at [nexus.bisih.org](https://nexus.bisih.org)

Contact Ben Dyson: [ben.dyson@bisih.org](mailto:ben.dyson@bisih.org)