



Enhancing cross-border payments in a real-time world

Prerequisites, challenges and a possible path forward

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Contents

2	Executive summary
4	Background
7	Prerequisites to achieve cross-border real-time payments
10	Challenges
33	Appendix

Executive summary

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Cross-border payments through the correspondent banking model has long been the cornerstone of supporting global trade. However, the increased burden of compliance with and evolution of anti-money laundering (AML) and combating the financing of terrorism (CFT) regulations has led to banks reducing their network as part of a de-risking¹ movement. This reduction in global reach, alongside changes in the payments arena such as the introduction of real-time payments platforms, has led to a growing demand to revisit how cross-border payments are handled.

The G20² initiative in 2020, under the Saudi Arabian presidency, set out an initiative aimed at enhancing the cross-border arrangement to make these payments cheaper, faster, more inclusive and more transparent. The Financial Stability Board (FSB),³ in conjunction with the Bank for International Settlements (BIS) Committee on Payments and Market Infrastructure (CPMI),⁴ have worked on the roadmap and action plan, aiming at addressing these issues by 2027. The goal is that 75% of all cross-border payments should reach the beneficiary within one hour, with the remaining 25% within one day. With the growth in the implementation of domestic real-time switches, along with the increasing uptake in ISO 20022 financial message usage, attention is being paid to linking real-time platforms to create a new cross-border payments model.

While there are different models that will be necessary in this space, this paper focuses primarily on interlinking real-time domestic switches. It spells out the necessary prerequisites, which include considerations of interconnectivity, reach and scalability, regulatory requirements, foreign exchange (FX) and liquidity. It then looks in more detail at the associated challenges, which include each jurisdiction having its own monetary policies and frameworks, including switches having their own set of scheme rules; the lack of a common regulatory approach, specifically in the area of sanctions compliance, data protection and regulatory reporting; the lack of common usage of messages/fields (elements), even where both parties are using ISO 20022; concerns around reach and scalability; how to connect the parties that are required to make the interconnectivity happen; and last but not least, how the currency conversion can be managed. The paper also touches on the commercial considerations – while linking switches may make theoretical sense, is this supported by the commercial drivers that will drive wide market adoption?



The experiences of the various market initiatives are looked at in terms of how or if they have addressed these challenges. While detailed information is not always available, there are clear indications that a bilateral⁵ approach is not scalable, while in the multilateral BIS Nexus approach,⁶ many aspects have been highlighted that require the support of third parties to resolve. The takeaway is that while connecting switches bilaterally is possible, despite the complexities and challenges, to continue to work on a bilateral basis is neither commercially nor operationally viable. Therefore, the use of a gateway or intermediary, which operates in the space between the sending and destination switch, is the most efficient way to help achieve the G20 aim of enhancing cross-border payments. It should be remembered that the G20 is not specifically asking for real-time – as long as the majority of payments reach the beneficiary within one hour, then the goal is on its way to being achieved.

As BIS Nexus stated after its proof-of-concept exercise, there is no one-size-fits-all solution to improving the cross-border payments experience. To name a few considerations, there are countries without real-time platforms; countries where it is not commercially viable to put in place a linkage; and geopolitical and macroeconomic barriers. In addition, banks will need to look at the commercial and operational realities of meeting the needs for their customer base when deciding which models make sense for which particular cross-border corridor and currency flow. Other models, such as connecting to a domestic switch through a third-party – for example, through a solution such as Mastercard Cross-Border Services – or through a revised version of correspondent banking via Swift gpi, Swift gpi Instant or Swift Go, are also needed as options as banks look to support their customers in their growth ambitions.

Background

The recent de-risking approach of banks and rise of risk-based approaches to AML and CFT have had an impact on global payment flows, in particular the financial inclusion of vulnerable communities.⁷ Concerns about this de-risking, as well as innovation in cross-border solutions and changes in domestic clearing through increasing implementation of real-time domestic services, has led to the payments industry to consider new ways to approach cross-border payments.

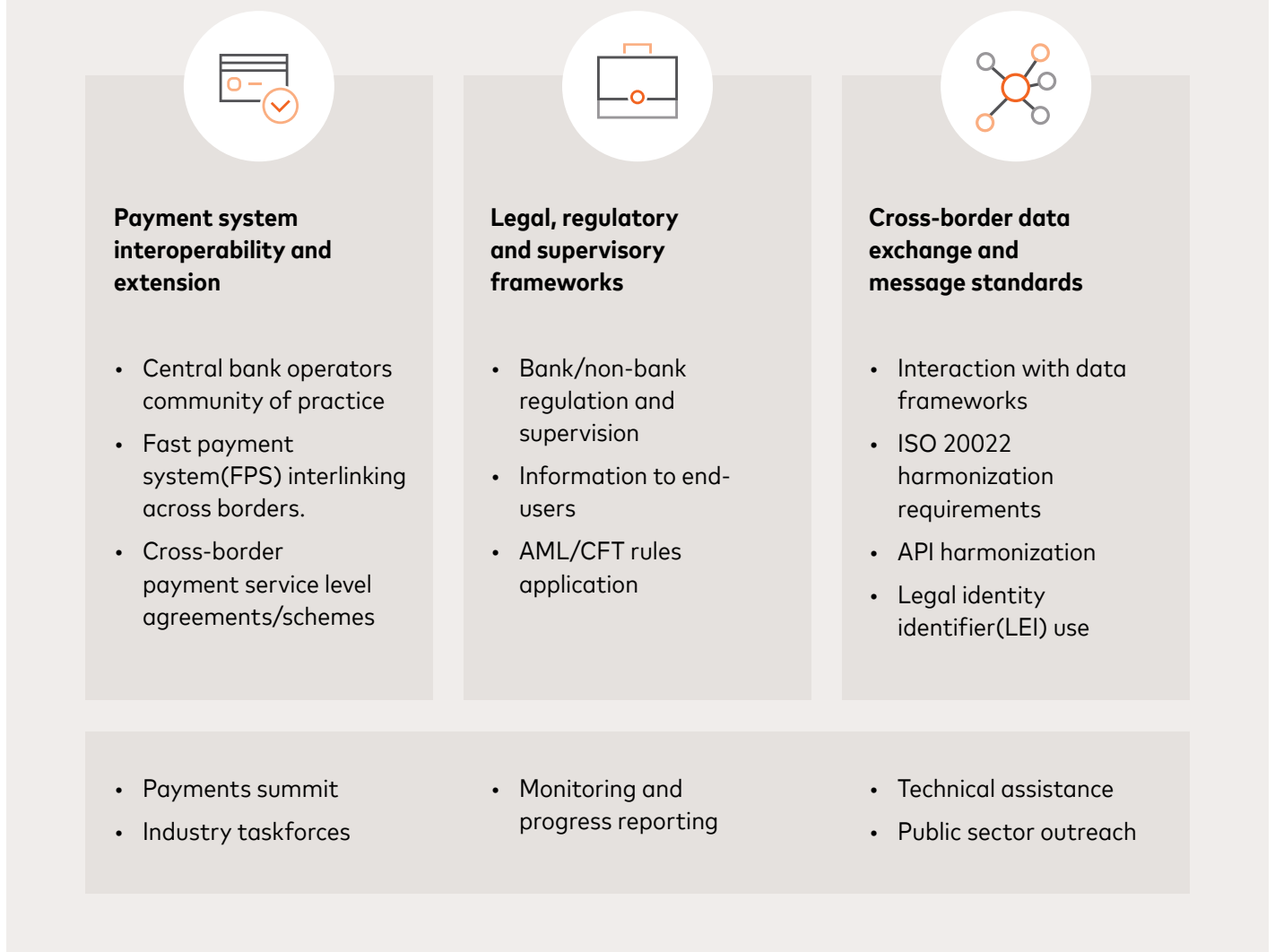
The G20 reflected this change by making cross-border payments an area of global focus, and the FSB has created a roadmap for enhancing cross-border payments, publishing in October 2022 a prioritization plan and engagement model for taking the roadmap forward, with the aim of achieving the quantitative targets by 2027.⁸ It sets out three priority themes that point towards interoperability of payment platforms and cross-border data exchange (see figure 1).

De-risking approach of banks and rise of risk-based approaches to AML and CFT have had an impact on global payment flows, in particular the financial inclusion of vulnerable communities.⁷

Figure 1: FSB – Cross-border payments enhancement - three priority themes⁹



Figure 2: FSB – Cross-border enhancement – actions to forward the priority themes¹⁰



Within each theme, the FSB identified a number of actions to propel the priority themes (see figure 2).

Many key players in the payments industry – banks, payment service providers and fintechs – are considering how they can best address the G20 initiatives and meet its targets (Box A: FSB target metrics (by end 2027 unless otherwise specified)).

The aspirations of the G20 and other bodies are being reflected in a number of market initiatives currently underway that are promoting frameworks and solutions that seek to address these needs in various ways. These include bilateral agreements, such as between Singapore and India, multilateral agreements, the BIS Nexus blueprint and Swift initiatives. A briefing paper that covers these initiatives can be found [here](#).

This paper aims to provide a degree of clarity in this area by:

- Identifying the capabilities that constitute the prerequisites required to meet the market needs
- Assessing the technical and non-technical challenges that must be addressed
- Discussing approaches being adopted by some of the market initiatives
- Offering a possible solution direction (which to be clear, would only be one of the possible models)

Box A: FSB – Target metrics (by end 2027 unless otherwise specified)

	Wholesale	Retail	Remittances
Cost	No target set	Global average cost of payment to be no higher than 1%, with no corridor costing more than 3%	Global average cost of sending \$200 remittance to be no more than 3% by 2030, with no corridor costing more than 5%
Speed	75% of wholesale payments to be credited within one hour of payment initiation ¹¹ or within one hour of pre-agreed settlement date if future dated. The rest should be credited within one business day ¹² Payments to be reconciled by end of day on which they are credited	75% of cross-border retail payments to provide availability of funds to the recipient within one hour of the initiation of the payment, ¹³ rest to be within one business day	75% of cross-border remittance payments to provide availability of funds to the recipient within one hour of the initiation of the payment, rest to be within one business day
Access	All financial institutions to have at least one option for sending/receiving cross-border wholesale payments	All end users ¹⁴ to have at least one option for sending/receiving cross-border electronic payments	More than 90% of individuals (including unbanked) who wish to send or receive a remittance payment to have access to means to do this
Transparency	Payers and payees to have the following information concerning cross-border payments:		
	<ul style="list-style-type: none"> • Total transaction cost (showing all relevant charges, including intermediary fees) • FX rate and currency conversion charges • Expected time to delivery funds • Tracking of payment status • Terms of service 		

Prerequisites to achieve cross-border real-time payments

Box B - What is cross-border real-time?¹⁵

Cross-border real time is about leveraging domestic real-time payments market infrastructures (switch) as a basis through the establishment of cross-border linkages. This network of payment rails could be used for both retail and commercial payment flows.

Real-time payments are electronic payments that allow

- The recipient to have visibility and use of the funds in seconds
- The ability to make and receive retail payments outside of normal banking hours – ideally on a 24/7 basis

The speed differs per country, as does the upper limit. For example:¹⁶

- Australia NPPA – within 6 - 15 seconds, no upper limit (banks can set one)
- India UPI – within 30 seconds, INR 1,000,000 per transaction
- SEPA Instant – within 10 seconds, upper limit of EUR 100,000
- Thailand PromptPay – within 60 seconds, no upper limit (banks can set one)
- United Kingdom FPS – within 2 hours, maximum of £ 1,00,000 (banks can set a limit)

Cross-border payments are defined as financial transactions where the payer and the recipient are based in separate countries. They cover both wholesale and retail payments, including remittances.

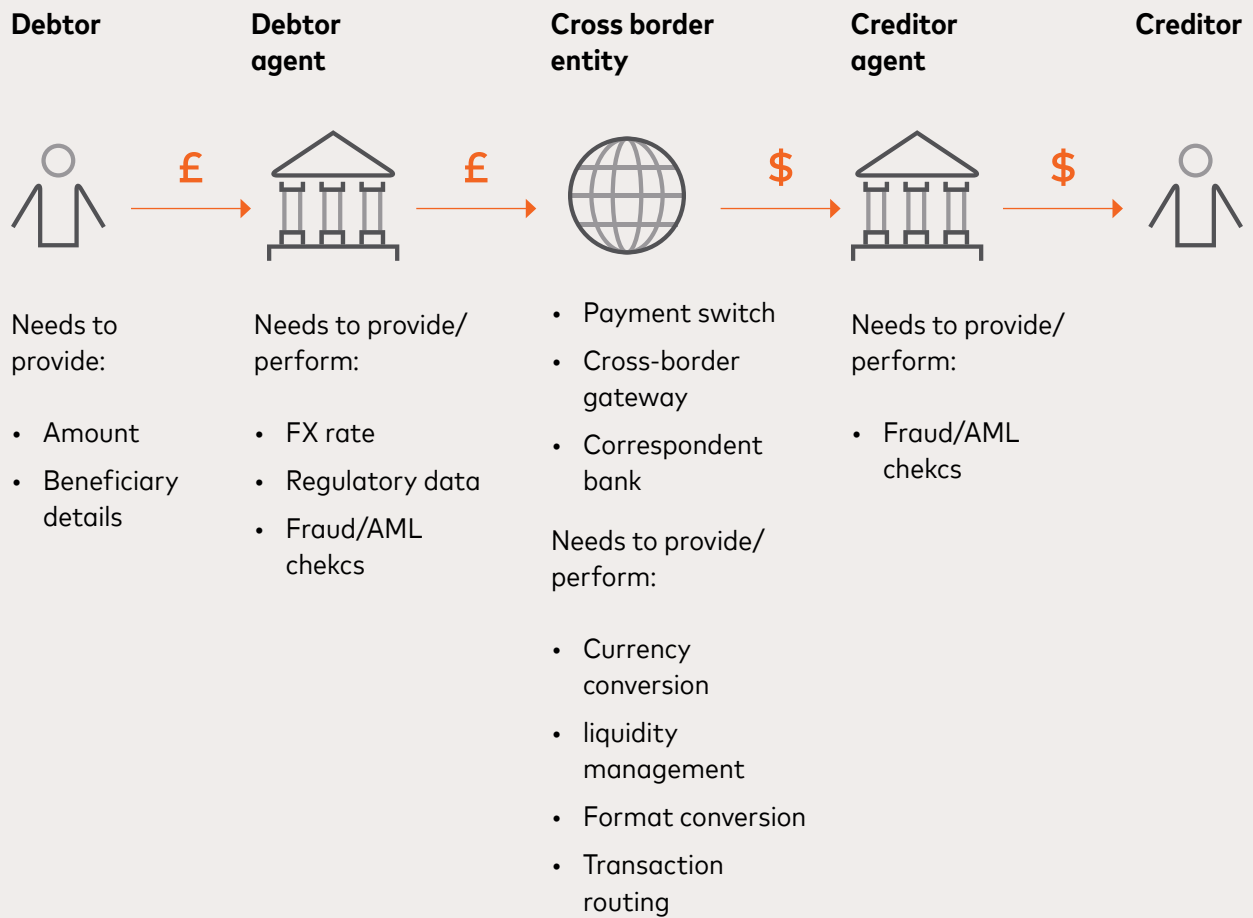
Irrespective of the design, any solution that seeks to meet the objectives of the G20 must incorporate a number of basic features in order to succeed.

1. Interconnectivity

To provide a service that delivers cross-border payments in real-time or near real-time, the connections between all parties that have a role within the solution need to be robust and all steps within the transaction flow need to be automated and seamless (See Box B – What is cross-border real-time).

Depending upon the nature of the solution, the connectivity that links the parties within the transaction flow may have to encompass functionality such as message transformation, message orchestration and onward routing to the beneficiary bank. These technical functions need to be completed in real time. In addition, business and commercial relationships will also need to exist between the connected parties to ensure all steps within the flow can be completed within the required time frames (see Figure 3).

Figure 3: Real-time cross-border challenges: A logical cross-border payment flow



2. Reach and scalability

Cross-border solutions have traditionally been based on bilateral relationships and included manual or semi-automated processes, consequently suffering from limited reach and an inability to scale. The impact on consumers can be negative, due in part to uncertainty as to where the funds are at any given time. This contrasts with the domestic experience, where the irrevocable nature of real-time payments influences consumer expectations on fund availability.

For a modern cross-border solution to succeed, once a connection is established between two countries, as many accounts as possible within those countries should have access to the service, and more importantly, the processes required to bring additional countries on to the service must not be excessively onerous, complex or expensive.

The design must also ensure that as volumes grow and new countries are added, there are no constraints within the solution that limit the ability to handle high volumes and multiple connections within the required timescales.

3. Regulatory requirements

Each party in a cross-border transaction has the responsibility to ensure compliance with regulatory requirements within its respective jurisdictions and to provide the relevant data to enable parties downstream in the transaction flow to undertake theirs. Failing to do so can lead to severe consequences such as fines, reputational damages or, in the worst-case scenario, loss of operating license.

Domestic payment services are required to comply with domestic regulations, not with regulatory requirements that apply to cross-border flows and, as such, have not been designed to cater to this enhanced regulatory aspect. Similarly, while the functional requirements of domestic services are broadly standardized, this is not true for cross-border payments, where countries each have their own regulatory requirements.

Consequently, if domestic payment switches are linked to provide a cross-border solution, it is likely that these switches will require modification¹⁷ to be able to meet cross-border regulatory requirements, for example, to the data carried in a message.

A degree of harmonization between the switches will also be necessary to ensure the regulatory requirements are addressed in a consistent manner, allowing them to interoperate.

Despite these challenges, meeting regulatory requirements is essential for any cross-border solution, and for a cross-border real-time solution, the requirements need to be met seamlessly and as part of a straight-through process.

4. Foreign exchange and liquidity

Banks that offer cross-border real-time payments must ensure that they always have access to adequate funds in the destination currency to enable continuous processing. This can be achieved in different ways, but whichever option a bank adopts, it must ensure that the liquidity is available within a suitable account to enable the seamless and immediate transfer of the transaction between the two payment switches. For example, the funds must be available in an account that can be debited by the second domestic switch when completing the second leg of the transaction within the destination country.

As part of payment initiation, the debtor bank must obtain an FX rate and present the rate to the payer with an option to accept or decline. The FX rate that is offered needs to be understood by the liquidity provider (see Figure 3), so it is “locked in” once agreed to by the payer and is used to determine the amount of liquidity that will be required to complete the transaction.

These steps must be completed within a time frame that meets the requirements of a real-time solution, and this rate needs to be made available to the beneficiary bank as part of the transparency requirement.

The approach a domestic switch uses to manage its liquidity may also have an influence on this – for example, whether it uses real-time gross settlement or deferred net settlement, or whether settlement is on central bank accounts or through banks' accounts within the switch.

Challenges

There can be a tendency to concentrate on the technical challenges that need to be resolved for a modern, efficient, cost-effective cross-border solution, but it is also critically important that regulatory, business and scheme/governance aspects are resolved as well, otherwise the solution will not be viable.

We have based our assessments around the idea of linking domestic switches to create a solution, as this is the design gaining most attention. It is recognized, however, that this is not the only model and that banks will need other options to support specific customer requirements for certain markets and use cases.

1. Scheme rules

1.1 What are the challenges?

One of the more difficult challenges to solve when linking domestic switches for cross-border payments is addressing that each switch has a set of rules that covers the end-to-end activities required to complete the transaction in its own domestic scheme.

In order for a cross-border payment service to function correctly, there needs to be a single set of scheme rules that all participants understand and adhere to. Similarly, there needs to be strong governance with a clear understanding of ownership, contractual obligations and the roles and responsibilities of all participants in the service.

The challenge is that by their definition, cross-border services will span at least two separate jurisdictions, each regulated by their own central bank and monetary policies. While many countries will have similar, if not identical, operational rules and processes for real-time payments, this will not always be the case. Where there are inconsistencies, agreement needs to be reached in terms of whose rules take precedence.

Aside from overarching issues relating to oversight, regulation and governance, there will also be areas of potential inconsistency within the detailed scheme rules that may have a negative impact on the end-to-end solution, including mismatches in mandatory field usage, permitted values within drop-down lists such as error codes, and rules for handling exceptions.

1.2 How to address them?

In cases where the objective is to provide a single payments corridor between two countries, it might be possible for the appropriate parties within the two countries to review both sets of rules and to align where there are differences. The upshot would be a combined set of scheme rules that would be specific to that corridor.

This becomes more complex when additional countries are added to the service, or if the service is intended to provide a solution for multiple countries from the outset.

1.3 Is there a better option?

For regional or global services, a better approach may be to develop a new set of scheme rules from scratch, which would be generic, and which would cover all participating countries and banks. It would be most likely that an independent third party (possibly the service provider) would draft the rules and then have to gain approval from the regulators and scheme bodies within each of the participating countries.



2. Common regulatory approach

Alongside the scheme rules issue, there is also the challenge of the regulatory environment and governance model. When two switches look to work together, the regulatory aspects are an immediate cause for concern. Without a common understanding (which is not the same as a common legal standard¹⁸), a solution cannot succeed.

2.1 What are the challenges?

The following regulatory aspects, among others, need to be considered when looking at cross-border payment flows:

- **AML and sanctions requirements:** Typically, banks are subject to local AML regulations and need to ensure that robust processes are in place to appropriately mitigate money laundering and terrorist financing risks. These controls generally include AML risk assessments, a customer due diligence program, ongoing AML transaction monitoring and suspicious activity reporting.
- **Data protection requirements:** Data regulations in each jurisdiction involved in the payment need to be complied with to protect a customer's privacy and personal information. These regulations typically require banks to outline how they can access their own data, specify how their data will be kept, and disclose how they will be using customer data before collecting or using it, collect consent as needed, and to take steps to protect the data from unauthorized access or use. Many regulations also impose additional data protection requirements where data crosses the border, which must be considered from the outset.
- **Regulatory reporting requirements:** In many countries, there are expectations on reporting trade/ currency-related information to regulators for cross-border transactions. This information may include the amount of payment, the parties involved in the payment, the purpose of the payment, and transaction volumes. In particular, the purpose classification of a payment can be challenging because there is often no consistent usage between countries.

The additional challenge is that while the international payments area of a bank will have expertise in this area, this knowledge and experience is often not shared or available to the domestic payments part of the bank.

2.2 How to address them?

Banks and customers need to be aware of these additional requirements to ensure successful processing of payments and efficient handling of problems.

The only reliable source of what information a country requires is the country itself. This can be managed through bilateral or multilateral agreement between countries or through a central repository that can be accessed via API. If a central repository is used, it is crucial that this information is kept under constant review – failure to be up to date will result in payments being delayed or rejected.

Some information banks already have in their own control (ensuring that full name and address details are provided, for example). But there is some information that can only be obtained from the sending party initiating the payment. This is often already in place for traditional cross-border payments but even there, payments are often held up because the information provided is not in line with what is required in the destination country. As Swift has identified, the main reason for payments being held up is issues at the beneficiary side.¹⁹ An additional concern is ensuring that formatting and data usage is consistent to avoid delays.



3. AML and sanctions screening

3.1 What are the challenges?

Compliance with AML and sanctions imposed by relevant regulatory authorities for cross-border payments is critical. Screening can be complex and time-consuming, and banks need to be constantly vigilant to changes in the relevant sanctions list(s). Sanctions compliance requirements can vary widely between different jurisdictions and there are no clear common standards.²⁰ Banks can interpret the requirements differently, depending in part on their risk appetite, and they may have their own screening procedures / level of risk they'd like to be exposed to.²¹ Some of the specific challenges of AML and sanctions screening include:

- Complex and ever-changing sanctions lists that often contain inconsistent or poor-quality information
- Risk of false positives – on average, a false match against the sanctions list will result in a 24-hour delay to the payment²²
- Lack of resources and/or suitable expertise to effectively implement and manage sanctions compliance programs
- Difficulties of ongoing monitoring of customer transactions, behavior and risk profiles
- Siloed approach that hinders the aggregation of data across systems, divisions and geographic locations

Data protection rules, which place restrictions on sharing data, often create a conflict with the requirement to screen payers and payees using high-quality verified data that cannot be shared outside the country. In addition, it may be a breach of privacy laws to screen data against the breach of privacy laws to screen data against specific list(s), where it is not the law of a particular country.

3.2 How to address them?

The starting premise is that domestic switches should be, as far as is possible, unchanged, in order to reduce the barriers to connecting with other switches. But how do we obtain and share the information required with the destination country when this additional information is not required domestically. By using a common standard, ISO 20022, we could provide the structure that would support the sharing of the additional information required.

The short timelines for handling cross-border real-time payments does not permit the same approach to sanctions compliance as for traditional cross-border payments. A risk-based approach, with the emphasis on Know Your Customer (KYC)²³ and screening of customers to identify a potential sanctions nexus, is a leading approach²⁴.

3.3 How to reduce the risk of false positives?

To help reduce the risk of false positives (and thereby increase efficiency), providing more and accurate data is crucial. New developments such as reference data and ISO 20022 can play a key role as it can capture and transmit detailed and structured data on senders and beneficiaries, such as their names, addresses, date of birth and national identification along the payment chain. In addition, a pre-validation service, which verifies information before the payment is executed, will help meet regulatory requirements, improve the accuracy of screening and so reduce the number of false positives. Such screening tools are starting to be seen as a prerequisite of making cross-border payments.

4. Common message standards

4.1 What are the challenges?

When developing real-time domestic switches, the emphasis has often been on how to achieve this quickly and at low cost. Some countries have consciously chosen a full ISO 20022 implementation. Others have built on their existing implementations, often using ISO 8583 or legacy formats, which may have data limitations. Even where ISO 20022 has been used, often the implementation has been non-standard – the tendency has often been to use existing data and to find an element in a pacs.008 credit transfer that seems to meet the need, rather than necessarily following the data repository expectations.

Alongside common message standards, there is a wider aspect that needs to be considered – there is no global standard for “addressing” cross-border payments. While 85 countries (as of April 2023²⁵) make use of the International Bank Account Number (IBAN), many countries, such as the U.S., the Philippines, Singapore, Brazil and South Africa, do not. Account numbers in each country have different formats. Proxies may be an answer to this issue, but again, there are many different approaches to what counts as a valid proxy. In some countries, only a phone number is permitted, while others allow a citizen or corporate identifier. While the CPMI is looking to agree a set of ISO 20022 standards, these will not address this particular aspect.

4.2 How to address them?

ISO 20022 enables richer, better structured and more granular data end-to-end to be carried in payments messages²⁶. ISO 20022 is becoming the de facto financial messaging standard for traditional cross-border payments. As real-time gross settlement platforms for major currencies have already gone live or are in the process of going live with ISO 20022, Swift is strongly encouraging the change through the MT to MX (ISO 20022) migration program for cross-border payment flows. The migration is not mandatory for domestic switches, where there are other drivers for change, such as modernization and standardization, then introducing cross-border considerations at the same time will increase efficiency.

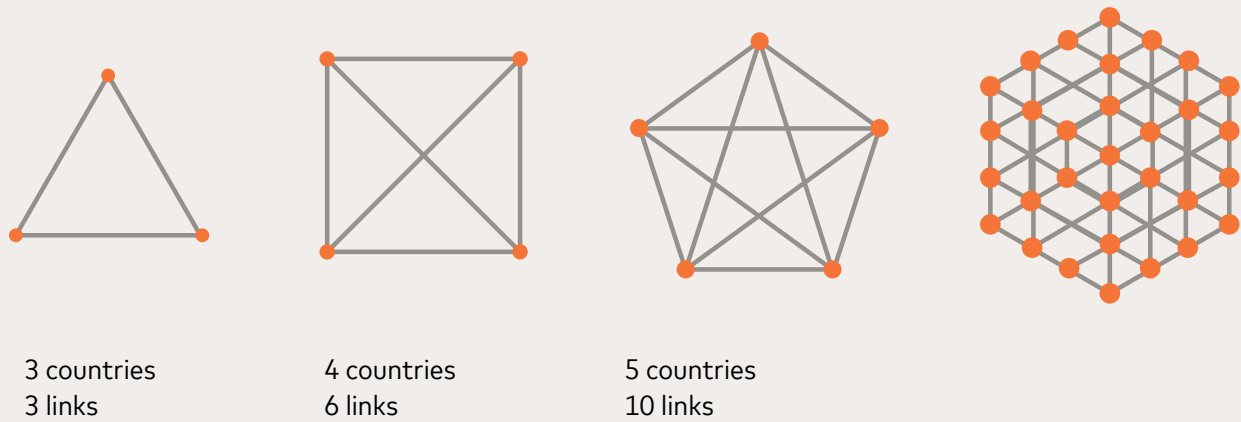
The additional data required to support real-time payments being processed cross-border can be supported through use of ISO 20022. This data includes:

- Information required for sanctions compliance
- FX-related information
- Indicator that the payment is cross-border
- Space for information about the FX and liquidity provider, if required
- End-to-end identification reference

One common standard, while providing a base for more interoperable exchange of cross-border payment messages, cannot solve the friction unless there is a common understanding and usage. While CPMI is looking to address this for cross-border payments through a public consultation on harmonizing requirements,²⁷ this approach also needs to be introduced in the domestic switches if the linking of switches is to be a successful way of meeting the G20 aim.

Migration to ISO 20022 is the direction of travel for both domestic and international payments, and message harmonization is a key element in the future of cross-border payments, taking advantage of the richer and more structured data. It must be recognized, however, that different markets are at different stages of ISO 20022 readiness. With the G20 2027 deadline less than four years away, a model is required that supports different message types and standards, and this may require the use of gateways or intermediaries to help address the issue. Furthermore, no matter which message type is adopted, there are still other issues, such as security and data, which will need to be addressed.

Figure 4: Complexities of adding new corridors



5. Reach and scalability

5.1 What are the challenges?

There are many examples around the world of particular payment corridors, where payment volumes between two countries justify the launch of a service that caters specifically for the needs of those two countries. But increasingly, banks and other industry stakeholders are looking for solutions that connect multiple countries, or ideally, that offer services on a global scale. In fact, the majority of the newer cross-border initiatives are seeking to provide multi-country solutions, even if they only cater for two countries on day one.

The main challenge that faces providers looking to offer broad reach and a simple process for adding new countries is harmonizing the disparate aspects of the domestic services discussed in the previous sections, namely:

- Message standards
- Meeting regulatory requirements
- Scheme rules

These elements can be harmonized (or at least mitigated) by entering into bilateral agreements, but the process becomes exponentially more complex each time a new country is added to the solution and consequently, the challenges of scalability and reach are not overcome through bilateral agreements.

A more efficient way to achieve both reach and scalability would be to include some form of gateway or intermediary between the sending and destination countries.

One additional challenge is the need to know whether a bank in the destination country is open to receiving cross-border payments. If this is optional, then this would need to be managed in the sending country.

5.2 How to address them?

The gateway would need to include some sophisticated functionality. It would need to be able to recognize which country the payment is destined for, understand which banks are "reachable" within that country, find a suitable liquidity bank to send the transaction to, and then transform (if necessary) the payment into the format required by the destination country. The gateway would also need to undertake any field mapping that is required to ensure data, including currencies, charges and intermediary institutions, are in the correct fields for the beneficiary bank.

The functionality required within the gateway would become more complex as more countries are linked, but it would be far more manageable to locate all the required capabilities within a single entity, rather than have all the banks or their local (domestic) switch providers perform these tasks themselves.

The functions of a central gateway would therefore likely include:

- Country identification
- Transaction routing
- Message mapping
- Proxy (alias) resolution
- Currency transposition

Some of the current market initiatives require their solutions to have multiple gateways – one for each participating country. In this model, the gateway within the originating country would identify the destination country and send the payment to the gateway for that country. This model simplifies the gateway functionality but makes the process for onboarding new countries more complex and expensive and would require extensive bilateral testing.



6. Interconnectivity²⁸

6.1 What are the challenges?

Interconnectivity between all participants within the transaction flow is a prerequisite for an efficient, scalable, cross-border real-time payment solution.

The complex nature of cross-border payments means that multiple parties are likely to be part of the transaction flow. Depending upon the nature of the solution, along with the capabilities of the paying bank, there can be requirements to connect FX providers, liquidity providers and intermediary service providers (for functions such as message translation and transaction routing), as well as the paying bank and the beneficiary

bank, all of whom need to have connections that enable dialogue and decisions within time frames required for an end-to-end real-time flow.

6.2 How to address them?

Connecting domestic instant payment services to provide a solution (as opposed to introducing a new, standalone cross-border solution) is an attractive option, as it leverages investment already made in real-time payments capability, is accessible to all participants in those services, and avoids the need for a new end-to-end payment solution, with all the upheaval that would involve.

However, while this provides a neat solution for the end-to-end delivery of the payment, it does not address the cross-border specific functions that are not applicable to domestic payments. To fully support cross-border real-time payments through the linking of switches, robust and performance connections will be required between all the participants.

Another consideration when looking to connect two domestic real-time switches is whether the connection should be synchronous or asynchronous (Box C - Synchronous vs asynchronous).



Box C: Synchronous vs asynchronous

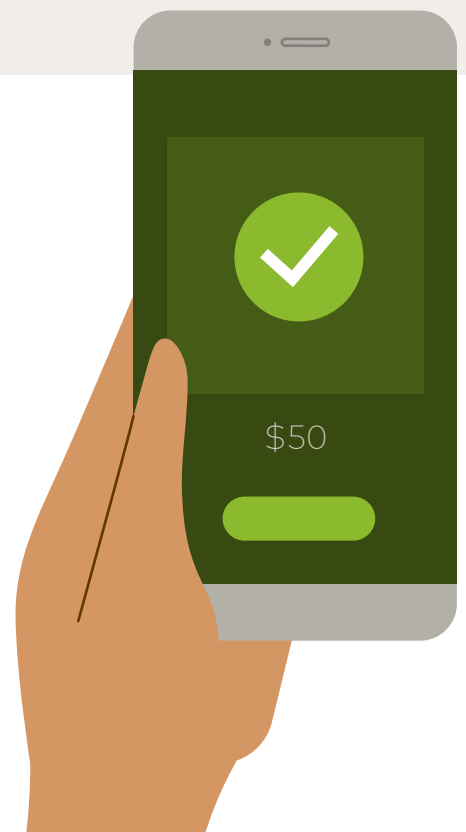
One consideration that should be considered when looking to connect domestic switches is whether the connection should be synchronous or asynchronous.

A synchronous connection is when the transaction flow constitutes a single passage all the way from the sending bank, through the two domestic switches to the beneficiary bank and back again. The flow would be governed by a single set of time-out mechanisms and if there was a break anywhere along the chain, the transaction would be deemed incomplete.

An asynchronous connection would be when each of the two switches has its own "self-contained" flow, which is bridged by an intermediary party. The first switch considers the transaction complete when it has received acknowledgement from its receiving party that the transaction has been received and either accepted or rejected. A second flow commences when the transaction is submitted to the second domestic switch.

The synchronous model is cleaner in that the transaction is either accepted or rejected within a single end to end flow. There is no uncertainty as to the outcome. However, this model extends the elapsed time of the single flow and creates a dependency between the two switches. If the second switch takes too long to process and respond, an excessive number of timeouts are likely to occur within the first switch.

Asynchronous removes this dependency and time-outs should be less, but any failures within the second switch will need to be "backed out" of the first switch, as it will have previously marked the transaction as complete and successful. There are pros and cons to each model.



7. FX and liquidity

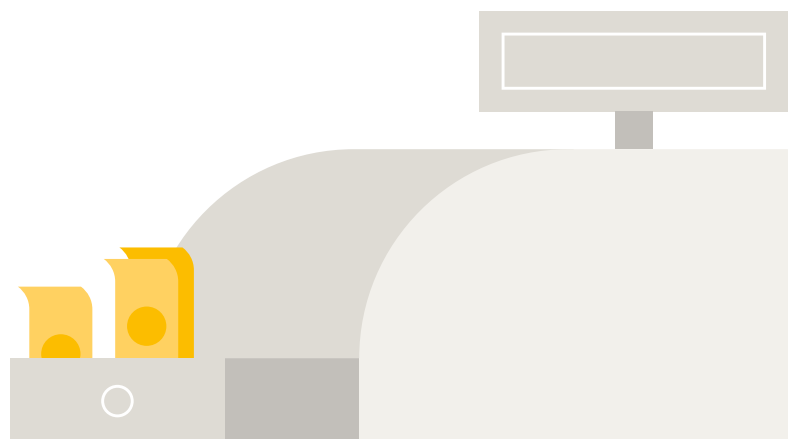
7.1 What are the challenges?

While FX has specific challenges that need to be looked at in more detail, liquidity and FX need to be considered together, since one impacts the other. Liquidity is about ensuring that the funds are available when and where they need to be to ensure the smooth running of a domestic switch. In the case of cross-border real-time payments, a liquidity provider needs to ensure that the funds are available in the right currency for the destination switch. The FX rate needs to be known and locked in so that the liquidity provider can perform this task. The roles could be combined, with the FX provider and the liquidity provider being the same party, but if not, the FX provider would need to have an account with the liquidity provider and ensure that the account is funded.

There is also a need to ensure that the liquidity to meet expected payment flows over the weekend and on public holidays is available. This may require active or automated management of the level of funding in settlement accounts. Over time, banks will need to rely more on historical data in order to identify trends and patterns that will help bank treasurers ensure that their funding approach is optimized.

Having the funds available in the right currency is one aspect. There are other aspects in the FX space that need to be addressed:

- Obtaining an FX rate to share with the customer
- Sharing FX information
- Changing the sending customer environment to permit sending of cross-border funds
- Changing the receiving customer environment to permit receipt of cross-border funds



Options for FX rates

The longer a rate is valid, the higher the spread on the rate. For simplicity, offering a rate that is valid for one day makes sense – the rate would be obtained once a day, loaded in the banking platform at the start of day, and would always be available. However, during the day the exchange rate might fluctuate, and therefore the spread (the difference between the buy and sell rate compared to the mid-rate) is larger to compensate for this risk.

The alternative is to have an on-request rate – for example, when a customer wants to make an SGD 100 payment from Malaysia to Singapore, the rate valid at that moment would be shared. This has the lowest spread and therefore has the best rate. However, it requires the sending bank to obtain the rate for every single transaction through an API call, which has a higher cost associated with it and has the risk of failure to receive a rate. There is also a need for the customer to confirm the payment promptly – otherwise the rate may have changed, which provides banks with an additional risk.

In between these two extremes, a rate can be fixed for a time period, such as two or four hours. This could be in two ways – the rate remains valid for an individual customer for two hours or the rate is refreshed every two hours. Usually when the rate is fixed in this way, it is necessary to add a code to the payment instruction, so that it can be verified that the rate is valid. The spread in this case will be higher than with an on-request rate and lower than the day rate.

The challenge in managing FX depends in part on the size and nature of the bank – small family bank, larger specialized bank, regional bank, or global bank. Furthermore, the regulatory environment in which those banks operate may impact what is possible:

- Smaller banks often will not have the in-house expertise and therefore will be very reliant on a third-party FX provider, be that another bank or a gateway/intermediary. They are also unlikely to have the volume necessary to justify building up that expertise.
- The same limitation may apply to banks that may be larger but concentrate on serving a particular domestic niche market.
- Regional banks may have sufficient volume and expertise to be able to select an in-house solution, so the decision to go in-house or third-party is one that requires strategic consideration.
- For global banks, the expectation is that they will have an in-house FX solution and will also be willing or able to operate as a third-party FX provider. This will depend on their participation in the relevant domestic switches – in some countries where they do not have a local presence, they may also need to rely on third-party FX providers. Even where the head office may be keen to facilitate cross-border real-time payment processing, this may not be possible in all payment corridors they may be interested in.

7.2 How to address them?

A bank will need to support their customers in the ability to indicate to which country the payment is going and whether the value is in the sending or receiving currency. For example, if from Malaysia to Singapore – the customer will need to indicate whether “100” means MYR 100 should be paid (debit MYR 100, convert to SGD equivalent) or SGD 100 that should be received (debit equivalent amount in MYR). In either case, as part of the need for transparency, the rate needs to be shared with the customer to make a decision whether to accept it.

As part of the G20 requirements for transparency, the customer making a cross-border payment should have information about the FX rate. There are several approaches possible:

- The sending bank manages its own FX position in-house
- The sending bank uses a partner bank to obtain the FX rate
- A gateway or intermediary provides the FX rate for all participants of the sending switch

In all approaches, banks and the switch need to consider whether just one provider is sufficient or whether more than one is required to avoid a single point of failure.

Once an FX rate has been agreed upon, this needs to be shared with the party that is doing the transposition (converting from sending domestic currency to destination currency using the agreed FX rate) and carried through to the beneficiary bank for sharing with the beneficiary. Sharing the FX information is in many countries already in place for traditional cross-border payments. However, this is not generally supported for domestic platforms or for domestic switch formats. Changes will be required to address these issues. ISO 20022 supports the sharing of additional FX information, but this is only applicable once all domestic switches have migrated.

There are also challenges which need to be addressed on the side of the destination country. Assuming the G20 concerns about transparency extend to the beneficiary party, the beneficiary bank needs to be able to pick up and display the original currency, payment amount and the exchange rate.

This is something that happens in many countries when looking at payments received through traditional correspondent banking but is not currently available or needed for a domestic switch. Information needs to reach the destination banks either directly from the clearing, in a pass-through model, or through a separate intermediary model where they can access the information.

For all banks regardless of their size, the commercial considerations should very much be part of their decision-making process, because this will determine whether a particular corridor is of interest to their customers (Box D - Commercial Considerations).

How a domestic switch manages its liquidity is also a factor that needs to be validated – does this fit in with the concept of cross-border real-time payments? There needs to be a review of whether there are any additional risks to liquidity management where payments are going cross-border – is the model in use, be that deferred net settlement or RTGS impacted, fit for purpose? Can the return of funds from the destination switch (or indeed destination bank) be managed in the sending switch?

Box D - Commercial considerations

G20 has identified a need for enhancing global cross-border payments, but success can only come if all players are on board, including banks that will need to make investments not just on their own platforms and portals, but also in the domestic switches.

Customer segment considerations

- What is the level of demand for cross-border real-time payments in terms of volume?
- Is the level of interest sufficient to offset the increased costs associated with a cross-border real-time offering?
- Is this a way to win new customers or a way to retain existing customers (or a combination)?
- Which customer segments are interested in this corridor — consumer, small and medium-sized businesses, corporates, global companies? What are the needs/expectations of the different segments?
- How will the customers use the service — sending funds to the destination country, using their home bank account to make purchases while in the destination country, or trade purchase, for example
- Do customers (specifically large corporates) already have agreements for their cross-border payments? How competitive is their current offering? Will it be necessary to absorb FX costs to make the real-time offering compatible with existing cross-border offering?
- What is the value of the payments? The upper payment limit in the destination switch may make this cross-border real-time commercially non-viable for the more lucrative corporate segment.
- What other alternatives do these customers have and how competitive is cross-border real-time payments compared to them?
- Is the driver to put the cross-border real-time corridor in place driven by a monetary authority? Does the bank have the option of putting in place the best solution that balances the push from the authorities with the commercial considerations?
- What are the needs of those customer in the cross-border real-time payments space in regard to exchange rates?
- What is the need of the remitter vs. beneficiary?
 - Do the senders want to send a fixed amount in their own currency and are not so concerned about what the beneficiary receives (for example, sending funds to a relative), in which case the beneficiary takes the FX risk?
 - Or do they need to send an exact amount to the beneficiary (for example, paying for goods or services), so the sender takes the FX risk?
 - Depending on the need, the interest of the customer may differ concerning the FX rate.

Foreign exchange revenue considerations

Revenue from FX conversion is one of the few opportunities for revenue in the account-to-account payments space for a bank. The commercial realities in this space are similar to that of cross-border correspondent banking or money transfer services but have some additional considerations:

- Consumers in particular are used to the fee-and-service-level approach provided by their domestic banking system. The expectation may be that this extends to cross-border services when two real-time platforms are linked. This may reduce the space for revenue generation through FX spread.
- What alternative methods are there for funds to reach the destination country. The margin and costs of those alternatives could also impact customer expectations.

In addition, there are other aspects that become relevant because of the real-time nature of the payments flow:

- A bank needs to consider how important it is that they provide a competitive FX rate that can fluctuate during the day, or whether they want to offer a consistent rate to their customers.
- How often will a customer make a payment on a particular day – if more than once, then there may be a need for consistency (the FX rate provided at 9 a.m. should be the same as the rate provided at noon, otherwise it will cause customer dissatisfaction).

Failure to make the right decision on the commercial approach concerning FX could lead to a business model that is non-viable – higher costs than can be covered by the increased revenue, or offering a solution that the consumers find non-competitive and therefore not generating enough volume.

8. Considerations within a possible solution

It is clear that there are significant challenges that need to be overcome to meet objectives of the G20 to enhance global cross-border payment arrangements to facilitate cheaper, faster, more inclusive and more transparent payment transactions.

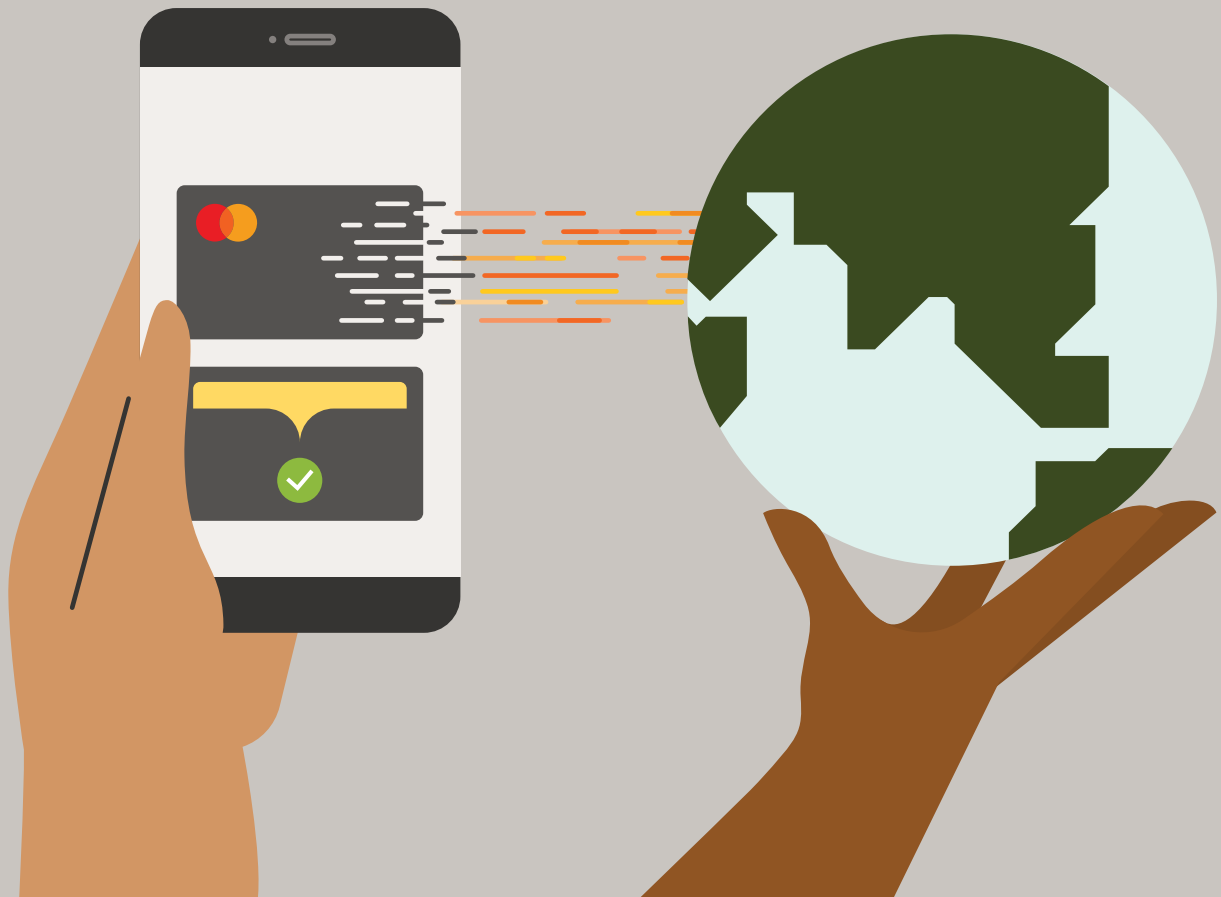
To stand the best chance of succeeding, a solution must address these four prerequisites for an efficient cross-border real-time service. It must do so in such a way that minimizes the cost and upheaval of implementation while offering sufficient flexibility to enable financial institutions to participate in a way that reflects their capabilities and business priorities and to develop customer propositions in accordance with their product strategies and the needs of their specific customer base.

The most effective way to achieve reach and scalability while keeping implementation costs to a minimum would appear to be the linking of domestic real-time payment switches to deliver the payments cross-border. This also has the benefit of providing the interconnectivity that can deliver the payment messages end-to-end in near real time.

A "gateway" would sit between the switches in the sending and destination countries and would perform various functions, including transformation between message standards (if required), mapping data elements required for regulatory purposes, and routing the message to the correct party for onward processing in the destination country. While the ISO 20022 standard has become the de facto industry standard for real-time payments, not all markets and certainly not all banks have adopted ISO 20022 yet, and there will need to be a translation and mapping capability between ISO 20022 and other standards, such as ISO8583, for the foreseeable future.

The expectation is that a service launch would focus on a particular payment corridor where the prospective volumes make the service commercially viable and there is a clear incentive for banks to join. With the gateway model outlined above, new corridors could be added relatively simply (each additional country would require work within the gateway, but considerably less effort than if the gateway did not exist).

It is worth noting that even a single payment corridor is going to be bi-directional and the requirements for harmonization work in both directions – each country will have their own requirements for both incoming and outgoing payments and these will all need to be aligned.



The linked switch model with a central gateway is an effective way of maximizing reach. However, these implications need to be considered:

- Not all countries have a domestic real-time payments switch. This could lead to a two-tier service, whereby payments sent to some countries are processed in real time, while others have to be fed into a batch process, which may take hours or days to complete. This in turn could lead to a requirement for the sending bank to quote different terms and conditions and different prices, depending on where the payment was destined
- Aspects such as proxy alias resolution, no common account number standard, and different upper limits to the payment amount are all factors that add complexity and need to be addressed.

- While there are strong similarities between domestic real-time payment switch functionality, there are differences, and there are also differences between domestic scheme rules and operational processes.
- Some of these differences can be mitigated through functionality provided within the gateway, but others (primarily those relating to scheme rules) may be harder to address. It may be the case that rather than attempt to harmonize the different scheme rules across all participating countries, a new set of scheme rules is developed that is applicable to all countries that participate in the relevant cross-border solution. This will result in two schemes operating within a single domestic switch, which may be a scenario it is not able to cater for this and which may need to be upgraded as a result.

The simplest approach to creating new scheme rules would be for a third party (possibly the solution operator/vendor) to prepare them and have all participating countries agree to comply with them. But this approach might encounter resistance from local schemes and regulators, which might require an alternative approach.

Careful consideration of the processes for obtaining an FX rate and liquidity in the destination currency is also needed.

Larger banks may wish to keep the FX process in house (although even the largest banks may not keep funds in all currencies), but the majority of participants will probably require some form of callout to an external FX provider, and this may be a utility that forms part of the central solution. So, three options may be considered for FX: in-house, callout from the bank to their preferred service provider, or a central utility provided by the cross-border solution.

The position is similar for liquidity management and settlement. It is likely that some form of correspondent relationship will be required to ensure that adequate liquidity is maintained within an addressable account that can settle within the destination domestic switch. Some banks may wish to keep this liquidity within their own accounts, while others will hold accounts overseas that can fulfill that requirement. It is also possible that the cross-border solution could include routing transactions to predefined intermediary accounts within destination countries. If this were to be included, separate liquidity messages would need to be exchanged between the sending bank and the intermediary bank to ensure all transactions and values could be reconciled and accounted for.

A final note on models: When it comes to cross-border solutions, one size most definitely does not fit all use cases.²⁹

There will be certain types of payments (high value/wholesale) where alternative solutions such as the traditional correspondent banking models are still the most appropriate. There are also likely to be markets where the transaction volumes are so low or the currency is deemed exotic, that the prospect of delivering an end-to-end real-time service is not commercially viable.

This would also be the case if one or both countries within a transaction does not have a real-time domestic switch.

The most effective solutions will also factor in adequate flexibility to cater for unforeseen situations following launch. For example, geopolitical scenarios might result in sanctions being applied to particular countries or banks within a certain country, changes in a country's regulations, such as the introduction of exchange controls, or some form of financial crisis that might affect countries' ability to collaborate and reciprocate.

The Buna and TIPS³⁰ initiative also called this out: "geopolitical risk, i.e., the risk associated with wars, terrorist acts, and tensions between States that affect the normal and peaceful course of international relations, should also be considered when evaluating a cross-currency operation. In order to manage this type of risk, various mitigation measures should be deployed, encompassing technical solutions, operational procedures, and legal arrangements."³¹

Alongside geopolitical risks, macroeconomic risks also need to be taken into account — changes in exchange controls³² may impact the chosen solution for handling the FX aspect as well as the viability of the linkages with a particular country. How will that be handled from a commercial perspective, particularly considering the real-time nature of the payments flow?

It is also highly likely that developments in central bank digital currencies and distributed ledger technology will start to play a significant role in cross-border payments, and solutions should be open to embracing innovation in these areas if and when they become part of the mainstream.

9. Assessing market initiatives

There are a number of market initiatives looking at meeting the G20 aims.³³ These include bilateral and regional initiatives, such as a proof of concept between Buna and TIPS, linkages between the Monetary Authority of Singapore and India's Unified Payments Interface, and the shared vision of the ten members of the Association of Southeast Asian Nations for a multilateral network of payment linkages by 2025 based on the BIS Nexus blueprint. These initiatives are concentrating on connecting domestic real-time platforms. There are also other approaches, such as Swift gpi instant, the EU One-Leg Out Instant Credit Transfers (OCT), The Clearing House (TCH) and EBA Clearing's Immediate Cross-Border Payments (IXB³⁴) and Mojaloop,³⁵ which look to address enhancing cross-border payments through different models.

The reports from the proof of concepts were reviewed to see if the challenges they faced were similar to the ones covered in this paper. There was a clear overlap, but this paper calls out more aspects that were not covered in these limited exercises. Not all initiatives have published usable material, therefore the input is primarily from two proof of concepts – Buna and TIPS, and Nexus, with some information from IXB.

Regulatory, legal and administrative aspects

The Buna and TIPS proof of concept report³⁶ identified that jurisdiction and enforceability of judgments is an issue – the source of legal risk is linked to the difference between the relevant jurisdictions and potential problems in ensuring the enforceability of judgments among the different countries involved. The IXB proof of concept reinforced this: “Technically the pilot was successful, but the legal and administrative aspects of the system haven't been worked out yet.”³⁷ “In hindsight, TCH recognized that the technical as well as the legal and administrative aspects should have been worked on in parallel.

According to the Nexus proof of concept report, each bilateral link would require complex legal negotiations between payment system operators, central banks, banking associations and individual banks. This investment is only commercially viable when connecting close trading partners or strong remittance corridors, meaning that many lesser-used corridors would never be connected bilaterally.



Common message standards

Although both Buna and TIPS used ISO 20022 domestically, they used different versions (TIPS had not yet migrated to the 2019 version at the time of the proof of concept). Setting this to one side, it identified a number of differences, including elements being mandatory for one service provider but not the other, absence of appropriate elements to convey information relating to currency conversion, Latin character usage, and differences in error reporting messages. Three alternatives were proposed:

- The complete update of the specification of one platform in order to be compliant with the specification of the other
- A partial update of the specification of both platforms in order to allow the intercommunication
- The adoption of a message translator between TIPS and Buna to enable online translation from one specification to the other for a correct intercommunication without the need to force changes to the platforms. This approach, however, relied on misuse of data blocks to support the carrying of information.

In the Nexus technical proof of concept, as with the Buna and TIPS example, each participant was using the ISO 20022 message format for their domestic payments, but certain elements in a message were used differently. It was considered whether Nexus should perform a payment message translation role but ultimately this would be too complex and may not meet the needs of the individual payment service providers (PSPs). The conclusion was that Nexus should set usage guidelines for ISO 20022 messages, with these usage guidelines being adapted from the Cross-Border Payments Reporting Plus usage guidelines.³⁸ Switches not following the guidelines would need to translate their messages before sending to the Nexus gateway and upon receipt from the gateway. The expectation that the CPMI Harmonization work would resolve this issue (presuming that domestic switches migrate to the common understanding once it is implemented).

Issue of proxy usage

Nexus identified that proxy formats varied from country to country, with some only permitting phone numbers while others allow corporate registration numbers or virtual payment addresses. The proxy types often have different formats, and in some countries, there are no proxies. Nexus accommodated this wide range of addressing formats by dynamically providing payment service providers (PSPs) with the addressing and proxy formats available for a specific country (at the time that a payment to that country is being initiated) and enabling proxies used domestically to be mapped to account numbers for cross-border payments.

Compliance

The bilateral Buna and TIPS pilot identified the following considerations:

- As part of the Buna onboarding package for market participants, the Buna Rules document states what the rules are.
- Buna applies its own compliance controls on all transactions exchanged via the platform, as it is operating effectively as the FX/settlement provider.
- From the perspective of the Eurosystem as T2/TIPS Operator,³⁹ it is worth noting that no specific AML/CFT control is performed, as this task is delegated to and performed by each participating national commercial bank. Should a suspicious activity be reported, the T2/TIPS Operator, if requested by the Eurosystem, may suspend or terminate the account of the reported participant.

Sanctions screening, according to the Nexus report⁴⁰ stated that “The most challenging frictions in (instant) cross-border payments is sanctions screening. There is often a conflict (real or perceived) between the requirement to screen payers and payees using high-quality verified data, and the restrictions that data protection rules place on sharing these data.” The report concludes that “it is not realistic to expect the industry to move to a single standardized design. Instead, it is important to find ways to accommodate those differences, both through tools that support technical interoperability, such as ISO 20022 standard for message formats and APIs, as well as through methods to promote business interoperability such as cross-border scheme that gives IPS⁴¹ a clear rulebook for their interactions with other IPS.”

In particular the report called out:

- There is no time for manual review of payment instructions.
- To overcome the lack of time issue, participants should try to enhance the data included in a payment instruction. This can be done through using information provided by the proxy resolution service⁴² or via a direct request for information sent to the destination bank (PSP).⁴³

- A “non-time-critical” payment option is recommended. This would give a destination bank or PSP limited extra time (such as up to two hours) to review a payment before crediting it to the recipient (or blocking or rejecting it, as appropriate). In this case, the payment itself has been processed “instantly,” like any other Nexus payment, and the funds have reached the destination bank or PSP, but they do not immediately credit them to the recipient.
- A slight delay seems to be preferable to the alternative of rejecting many legitimate transactions.
- But banks and payment service providers are moving to more modern API-based or even mutualized sanctions screening services, so the number of false positives should start to fall, and a growing percentage of payments should be processed instantly, right through to the recipient.

Review of bilateral initiatives seemed to have less emphasis on this aspect, based on available published information.

FX and liquidity

The Buna and TIPS bilateral proof of concept flagged concerns of currency exchange risk:

- Should the foreign currency exchange/trading leg of a cross-currency transaction fail (for instance, because of a delay in the provision of foreign exchange rates or in the actual currency conversion, resulting in the unavailability of foreign exchange funds in the currency of the beneficiary), the instant payment transaction itself would fail.
- The parameters of the contractual liability of a non-Eurosystem central bank (including its ceiling) will depend on the provisions of the contractual and other legal documentation governing the relationship between the relevant central bank and its counterparty sending banks (originator PSPs).

Nexus expressed on the settlement side that funds must be secure before a payment instruction or confirmation is sent to Nexus and leaves it to the switch to decide how to ensure this through:

- Immediate transfer of funds
- A funds reservation that locks up funds in the accounts
- A pre-funding arrangement where other funds are put aside to cover the obligations of a sending bank (source PSP) that unexpectedly fails
- Opens the door to other alternative payments infrastructure, such as CBDCs, to connect to Nexus provided that they can meet the same requirements of providing secured funds and instant payments.



10. Conclusion

For many years, cross-border payments have been made primarily through correspondent banking, but the move to the de-risking approach and the risk-based approach to AML/CFT has led to a reduction in the number of banks willing or able to operate in this space. This has impacted global payment flows and in particular financial inclusion of vulnerable communities. The 2020 G20 initiative on enhancing cross-border payments, which the FSB and BIS are developing into practical actions and roadmaps, will have an impact in this space. One particular model – interlinking domestic real-time switches via an intermediary entity such as a gateway – is emerging as possibly the most viable option.

This paper has looked at the prerequisites for achieving improvements in the cross-border space and has gone into some depth on the challenges. A domestic real-time switch is oriented towards one country – it serves the needs of that country and its population. It operates in a single regulatory environment that all the participating banks understand, it is generally single currency, and it has a common set of scheme rules and expectations.

Connecting two domestic real-time switches brings new factors that need to be considered, including how to unite the scheme rules, a common regulatory approach, and what additional information required for AML/sanctions compliance.

The technical challenges of reach and scalability and interconnectivity can largely be addressed by connecting domestic switches but features also need to be included that ensure the FX and liquidity aspects are adequately considered. Beyond these concrete challenges are the geopolitical and macroeconomic factors – removing reach to a country through correspondent banking can be done more easily than de-linking domestic switches.

Connecting two countries is possible to manage: Bilateral agreements can be made, particularly where the government or monetary authorities are driving the initiative. However, this becomes more challenging as more countries are introduced. For this reason, the inclusion of a gateway or gateways would be the most viable solution to handle the complexities of orchestrating the flow of payments between all the various sending and destination domestic switches.

The BIS Nexus blueprint, which offers guidelines but leaves the implementation to the market, helps to provide guidelines but the conclusion of its pilot has shown that there are big gaps between a blueprint and reality. This is the challenge that companies such as Mastercard is looking to address.

It is clear that one solution will not answer all the needs of cross-border payments. There are countries without real-time platforms, countries where the payment flows are not commercially viable, and countries where there are too many other issues, often regulatory, which need to be addressed. Banks will be looking at a number of different models, and their solutions are likely to include a revised version of correspondent banking and more usage of market infrastructure solutions such as those offered by Swift (including Swift gpi, Swift gpi Instant, Swift Go, pre-validation solutions etc.). There is also room for solutions where third-party providers offer banks more access to beneficiaries in other countries, through solutions such as Mastercard Cross-Border Services. In the future, CBDCs are expected to play a greater role, which would bring new levels of interconnectivity needing to be addressed.

Underlying many of these initiatives is, of course, the need for a common message standard – ISO 20022. The migration of all cross-border Swift flows (due for completion in November 2025), the work by CPMI and the global industry Payments Market Practice Group (PMPG⁴⁴) to develop harmonized usage requirements for ISO 20022 in cross-border payments common message standards, and the increasing implementation of the standard in RTGS and domestic platforms are all essential for achieving the G20 goal of enhancing cross-border payments.

This paper has concentrated mainly on the cheaper, faster and more transparent aspects of cross-border payments and not so much on increasing inclusion. But research has shown that the introduction of a real-time payments system in a country results in reaching more people. For example, the introduction of PromptPay by ITMX in Thailand has given all citizens the ability to make and receive payments using their mobile phone, citizen ID or a QR code, helping connect more unbanked people to the financial world⁴⁵.

It is expected that by linking the domestic switches that have already delivered these benefits in-country will have similar benefits by exposing the benefits of fast, secure, cost-effective cross-border payments to previously underserved communities.



Appendix

1. De-risking refers to the phenomenon of financial institutions terminating or restricting business relationships with clients or categories of clients to avoid, rather than manage, risk. Much work has been done in this area by, among others, BIS, the Financial Action Task Force, the Wolfsberg Group, the World Bank and Swift. Swift's paper "[Addressing the Unintended Consequences of De-risking](#)" clearly describes the issue.
2. G20 is a forum for international economic cooperation that works to address major issues related to the global economy, such as international financial stability, climate change mitigation and sustainable development. In 2020, it has made enhancing cross-border payments a priority by making them faster, cheaper, more transparent and more accessible.
3. Financial Stability Board (FSB) is an international body that monitors and makes recommendations about the global financial system. It reports to the G20.
4. Bank for International Settlements (BIS) is the financial institution that supports central banks' pursuit of monetary and financial stability through international cooperation. It acts as a bank for central banks. BIS's Committee on Payments and Market Infrastructures (CPMI) is an international standard setter that promotes, monitors and makes recommendations about the safety and efficiency of payment, clearing, settlement and related arrangements, thereby supporting financial stability and the wider economy. The CPMI also serves as a forum for central bank cooperation in related oversight, policy and operational matters, including the provision of central bank services.
5. Note that bilateral assumes that country A sends payments to country B, and country B sends payments to country A.
6. [BIS Nexus Blueprint](#) is designed to standardize how real-time payment platforms can connect to each other.
7. Global Center on Cooperative Security, "[Understanding Bank De-Risking and its Effects on Financial Inclusion: An exploratory study](#)," 2015.
8. Financial Stability Board, "[G20 Roadmap for Enhancing Cross-border Payment: Priority actions for achieving the G20 targets](#)," Feb. 23, 2023.
9. [G20 roadmap for enhancing cross-border payments: Priority actions for achieving the G20 targets](#) (fsb.org).
10. [G20 roadmap for enhancing cross-border payments: Priority actions for achieving the G20 targets](#) (fsb.org).
11. A wholesale payment is considered initiated at the moment of entry into a payment infrastructure or correspondent bank as defined by its applicable rules. Financial Stability Board, "[Targets for Addressing the Four Challenges of Cross-Border Payments: Final report](#)," Oct. 13, 2021.
12. In cases where the hours or dates of the business days in the locations where the initiation and receipt do not coincide, the payment should be credited within a period that, in each location, includes one business day.
13. A retail or remittance payment is considered initiated when the payment order is received by the payer's payment service provider. The transaction is considered complete once the recipient is able to access the funds.
14. Individuals, businesses (including micro, small and medium Enterprises) or banks
15. There is a lack of consistency in the market in terms of terminology – often instant or immediate is used instead of real time. This same issue occurs when talking about domestic payments platforms.
16. [Global Tracker | Fast Payment System](#) (worldbank.org) Note that these are the quoted timelines that are not necessarily the time at which a timeout will occur.
17. The aim is to limit this modification – this is something that domestic switches will need help in achieving.
18. Two domestic switch systems could have a common understanding that would allow them to operate together despite each country having a different set of system rules. However, the two countries are unlikely to ever have a common set of regulatory standards, which could cause issues.
19. Generally, payments with end-to-end processing times that exceed hours or even days tend to spend more time at the beneficiary leg. For example, in the slower beneficiary regions such as North Africa and South and Central Asia, the beneficiary leg is by far the most time-consuming part of the average payment route. Countries with substantial capital controls tend to have longer payment processing times at the beneficiary leg. In addition, the speed of processing seems to be impacted by the number of banks, the hours of operation, the gross national income and the size of the time zone difference. [SWIFT gpi data indicate drivers of fast cross-border payments](#) (bis.org).
20. While the rules of the Office of Foreign Assets Control, the financial intelligence and enforcement agency of the U.S. Treasury Department, which administers and enforces economic and trade sanctions, are commonly applied worldwide, they remain U.S.-originated standards without legal standing unless they have been taken into domestic law. Similarly, the European Union standards are applied within the EU and in other countries, but there is no obligation for the standards to be used in non EU countries. Each country will also have their own standards, which may or may not overlap with OFAC standards. The sanctions applied in early 2022 against Russia, for example, were applied without coordination, leaving banks scrambling to comply with a very wide range of different sanctions.
21. For further details please refer to the FATF and the Wolfsberg Group. The Wolfsberg Group has collaborated with FATF to help combat financial crime and improve global standards for AML, CTF, and sanctions compliance.
22. LexisNexis Risk Solutions, "[KYC & Sanctions Remediation: The impact of inefficiency](#)."
23. KYC includes establishing the customer identity, understanding the nature of customers' activities, qualifying that the source of funds is legitimate, and assessing money laundering risks associated with customers. Swift, "[What is KYC?](#)"

24. The European Commission issued [a proposal in October 2022](#) looking to increase the take-up of instant payments in euro. This proposes that friction could be removed while preserving effectiveness of screening by verifying clients at least daily against EU sanctions lists, instead of screening all transactions one by one, which is the current approach of some EU countries for domestic payments. This would certainly make sanctions controls easier to implement for instant euro payments, however, complexities remain when interacting with countries not covered by EU law. OFAC issued a "[Sanctions Compliance Guidance for Instant Payments Systems](#)" in September 2022, which states that "financial institutions are encouraged to adopt a risk-based approach to ensure their sanctions compliance controls and related technology solutions remain commensurate with the sanctions risks presented by instant payment systems." This includes performing due diligence on their customers at onboarding and, at regular intervals thereafter, screening their customers to identify a potential sanctions nexus. Accordingly, solely domestic instant payment transactions generally pose a lower sanctions risk than those involving accounts maintained at non-U.S. banks, which may not be subject to similar regulatory requirements and examinations.
25. International Organization for Standardization, "[National IBAN formats](#)."
26. Swift, "[About ISO 20022](#)."
27. Bank for International Settlements' Committee on Payments and Market Infrastructures action 8: Finalizing the ISO 20022 harmonization requirements and promoting their real-world implementation. The final report is expected by the end of 2023.
28. Interconnectivity has been used rather than interoperability, since expected payments platforms will remain largely as they are, with the focus continuing to be on meeting the specific domestic needs. They are unlikely to be changed to enhance interoperability. The ultimate aim should be seamless interoperability, but in the short term, the requirement is for all components within the flow to have technical connections that will enable the payment to be delivered end to end in real time.
29. BIS Innovation Hub, "[Project Nexus: Enabling instant cross-border payments](#)," March 2023.
30. Buna is a cross-border payment system supported by Arab central banks and fully owned by the Arab Monetary Fund. Buna enables financial institutions and central banks in the Arab region and beyond to send and receive payments in Arab currencies as well as key international currencies in a safe, cost-effective, risk-controlled and transparent environment. TIPS is a fast payment system for the euro among Eurosystem countries run by the European Central Bank and is evolving from a single to a multicurrency platform.
31. Banca D'Italia EuroSistema, "[Cross-Currency Settlement in Instant Payments in a Cross-Platform Context: a Proof of Concept](#)," March 2022.
32. Exchange controls are government-imposed limitations on the purchase and/or sale of currencies. These controls allow countries to better stabilize their economies by limiting inflows and outflows of currency, which can create exchange rate volatility. Countries with weak or developing economies may put controls on how much local currency can be exchanged or exported — or ban a foreign currency altogether — to prevent speculation. Investopedia, "[Exchange Controls: Meaning & How Companies Get Around Them](#)."
33. See Mastercard's market initiatives in cross-border real-time payments.
34. The Clearing House is a banking association and payments company that is owned by the largest commercial banks and runs the real-time payments platform (RTP). EBA Clearing is the provider of pan-European payment infrastructure solutions, including RT1, a real-time gross settlement payment system for the execution of SEPA Instant Credit Transfers
35. Mojaloop is open-source software for creating digital payments platforms that can be used to connect all customers, merchants, banks, and other financial providers in a country's economy.
36. Banca D'Italia EuroSistema, "[Cross-Currency Settlement in Instant Payments in a Cross-Platform Context: a Proof of Concept](#)," March 2022.
37. Payments Dive, "[FedNow eyes cross-border enhancements](#)," March 31, 2023.
38. Cross-border Payments Reporting Plus (CBPR+) is a working group of payment experts drawn from the banking community all over the world, which is creating the global ISO 20022 market practice, usage guidelines and translation rules between ISO 20022 and the legacy Swift MT messages for cross-border payments over the Swift network.
39. The Eurosystem comprises the European Central Bank and the national central banks of those countries that have adopted the euro. The Eurosystem runs a number of payment infrastructures including T2 (previously known as TARGET2), the real-time gross settlement (RTGS) system and TIPS, a real time 24*7 settlement platform, currently for euro. The central banks of Sweden, Denmark and Norway have shown interest in joining TIPS to settle instant payments in their national currencies
40. Nexus, a BIS Innovation Hub (BISIH) project, explores how to build on the success of domestic instant payments to improve the speed, cost, transparency and accessibility of cross-border payments. [Nexus: enabling instant cross-border payments](#) (bis.org)
41. IPS – instant payment system
42. Proxy resolution allows, for example, the name of the recipient to replace the mobile number that was originally provided
43. The Request for Information (RFI) service was designed but has not yet been built into the gateway due to time constraints
44. Swift advisory group that provides a global forum to drive better market practices which, together with correct use of standards, will help in achieving full straight-through processing and improved customer service
45. Mastercard Newsroom, "[Real-time payments: What is RTP and why do we need instant payments?](#)" May 4, 2023.



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