

Possible answer for the questions on “Potential Federal Reserve Actions To Support Interbank Settlement of Faster Payments, Request for Comments”

Thank you so much for your sharing such informative document. It is very useful for me to develop Rapid Retail (faster) Payment in Myanmar. I really appreciate it. Let me try to make comments from my perspective though it may not completely fit in case of U.S.

Note: the comments are made solely for discussion purposes. Views expressed are those of the person who is commenting on the questions and do not necessarily reflect any official view of JICA, CBM, or any other organizations.

1. Is RTGS the appropriate strategic foundation for interbank settlement of faster payments? Why or why not?

(answer 1) Generally, I prefer the way which U.K. adopted in particular in Myanmar. More specifically, Rapid retail (faster) payment should be operated 24/7/365 just switching messages by mitigating risk using sender net debit cap backed by cash collateral.

Rapid retail (faster) payments need to be faster. As such, locking current accounts of sender bank and receiver bank opened at Fedwire (RTGS) may not be appropriate considering response time of the faster payment if retail messages need to be processed by Fedwire (RTGS). AS a matter of fact, an instant Payment may possibly debit sender current account first, then forward the message to receiving bank to credit customer account opened at the receiver bank before crediting to the current account of the receiving bank opened at the central bank possibly to reduce response time. In this case, customer account of payee is credited before the interbank settlement (though risk is mitigated by debiting senders account beforehand). It may be worth while comparing this scheme with the risk mitigating measures using sender net debit cap backed by cash collateral.

By the way, bond collateral will not be used for supporting sender net debit cap because liquidity of the bonds generally may not be sufficient when the balance of the current account is not sufficient at the designated time net settlement (DTNS). However, during daytime, current account can provide intraday overdraft by pledging government bonds as collateral including when settling net positions at DTNS.

2. Should the Reserve Banks develop a 24x7x365 RTGS settlement service? Why or why not?

(answer 2) I do believe the Reserve Banks have sufficient capability to develop RTGS system with 24/7/365 operation capability by securing central bank money during night time because the Banks have sufficient number of competent staff members to support it.

In case of Myanmar, we have only about 40 IT staff in central bank. It may be difficult to increase the number of IT staff considering current situation. Therefore, it will be difficult to operate RTGS system overnight. From this perspective, we will operate Rapid retail (faster) payment just switching messages checked by sender net debit cap based on cash collateral.

In case of US, there will be sufficient demands to effect payment messages 24/7/365 because USD is the vehicle currency globally. Also, retail payment systems will be connected each other in the near future globally. Cross-border transactions may need to be processed 24/7/365. Having said that, whether Fedwire (RTGS) needs to be operated 24/7/365 is not clear for me since Rapid retail (faster) payment can take care of such messages 24/7/365 if appropriate risk mitigating measures such as sender net debit cap backed by cash collateral is implemented.

3. If the Reserve Banks develop 24x7x365 RTGS settlement service,

a. Will there be sufficient demand for faster payments in the United States in the next ten years to support the development of a 24x7x365 RTGS settlement service? What will be the sources of demand? What types of transactions are most likely to generate demand for faster payments?

(answer 3 a) I don't know. But I do believe significant demands on 24/7/365 you have in retail faster payment in US because it is natural trend that non-cash payment instruments such as QR code will be used which need faster payment (switch) operated by 24/7/365 to meet demands to buy goods even midnight. At least faster payment needs to be operated 24/7/365.

b. What adjustments would the financial services industry and its customers be required to make to operate in a 24x7x365 settlement environment? Are these adjustments incremental or substantial? What would be the time frame required to make these adjustments? Are the costs of adjustment and potential disruption outweighed by the benefits of creating a 24x7x365 RTGS settlement service? Why or why not?

(answer 3 b) I don't know. But, if operating 24/7/365 is not mandatory, it may be under the discretion of each payment service provider and/or financial institution. In Myanmar, mobile banking service is generally 24/7. But it sometimes stop services without notice for probably many reasons. If you

would like to provide better services securing 24/7, competent IT and business staff members including helpdesk may need to be allocated 24/7 both FMI operator and bank sides which could increase operational cost significantly. Having said that we will need 24/7 services in many countries though the customers may not care whether interbank settlement is 24/7/365 real-time or not. How to reduce the risk will be the important issue.

c. What is the ideal timeline for implementing a 24x7x365 RTGS settlement service? Would any potential timeline be too late from an industry adoption perspective? Would Federal Reserve action in faster payment settlement hasten or inhibit financial services industry adoption of faster payment services? Please explain.

(answer 3 c) I don't know. But, if FMI operators show appropriate roadmap with relevant specifications, participants generally follow such roadmap (I hope). In case of Myanmar, Rapid retail (faster) payment system will possibly start operation in October 2020. Regarding the Rapid retail (faster) payment, there will be significant demand even developing countries such as Myanmar since the companies are expanding businesses drastically. However, demand for 24/7/365 operation of RTGS (CBM-NET FTS) may not be significant.

d. What adjustments (for example, accounting, operations, and agreements) would banks and bank customers be required to make under a seven-day accounting regime where Reserve Banks record and report end-of-day balances for each calendar day during which payment activity occurs, including weekends and holidays? What time frame would be required to these changes? Would banks want the option to defer receipt of such information for nonbusiness days to the next business day? If necessary changes by banks represent a significant constraint to timely adoption of seven-day accounting for a 24x7x365 RTGS settlement service, are there alternative accounting or operational solutions that banks could implement?

(answer 3 d) I don't know. We will keep RTGS operation as it is even though operating hour will be extended because it will not need such adjustment. Also, ATM and POS switches are already operated 24/7/365 in many countries including in Myanmar though there is some limitation for the maximum amount to be payed such as less than 1000 USD. There may be significant differences between opening RTGS (central bank money) for weekend and open Rapid retail (faster) payment switches secured by sender net debit cap backed by cash collateral. We will adopt DTNS (designated net settlement) to be processed only week days (not Saturday, Sunday, and holidays). It will possibly be easier, safer, and less costly.

e. What incremental operational burden would banks face if a 24x7x365 RTGS settlement service were designed using accounts separate from banks' master accounts? How would the treatment of balances in separate accounts (for example, ability to earn interest and satisfy reserve balance requirements) affect demand for faster payment settlement?

(answer 3 e) It (separate account) may be similar with cash collateral account from faster payment operational perspective without such adjustments. However, it is central bank money even in sub-account. As such, security level to protect it should be much higher. It is different from sending and receiving information (messages) through a switch.

f. Regarding auxiliary services or other service options,

i. Is a proxy database or directory that allows faster payment services to route end-user payments using the recipient's alias, such as email address or phone number, rather than their bank routing and account information, needed for a 24x7x365 RTGS settlement service? How should such a database be provided to best facilitate nationwide adoption? Who should provide this service?

ii. Are fraud prevention services that provide tools to detect fraudulent transfers needed for a 24x7x365 RTGS settlement service? How should such tools be provided? Who should provide them?

iii. How important are these auxiliary services for adoption of faster payment settlement services by the financial services industry? How important are other service options such as transaction limits for risk management and offsetting mechanisms to conserve liquidity? Are there other auxiliary services or service options that are needed for the settlement service to be adopted?

(answer 3 f)

(i) We don't have such proxy database or directory as phone number, but rather, provide interface for MFSP (mobile financial service provider) to access to Rapid retail (faster) payment within the message items of ISO 20022. QR code is being standardized in Myanmar based on EMVCo specifications. Interface between ISO 20022 and QR code (including ISO 8583) will be developed by MFSPs and/or participants (banks) which provide mobile banking. Could you refer to the reference material attached, please?

(ii) Fraud prevention schemes are certainly implemented appropriately.

(iii) Since this is retail payment services, AML/CFT may need to be checked though KYC is generally under the responsibility of each bank and MFSP. Some measures may need to be implemented to report to relevant authorities in case detected though this kind of issue is not payment system matter but rather bank supervision matter.

g. How critical is interoperability between RTGS services for faster payments to achieving ubiquity?

(answer 3 g) Interoperability is very important in particular for the faster payment which could be connected globally. From this perspective, standardization of connecting gateways and adopting international standards may be important. Could you refer to the reference material attached, please? Also, "Common understanding papers for this kind of issues" may be published by AEAN+3 next year.

Keeping interoperability between RTGS and Rapid retail (faster) payment systems may not be critical very much for us because they will be developed side by side.

h. Could a 24x7x365 RTGS settlement service be used for purposes other than interbank settlement of retail faster payments? If so, for what other purposes could the service be used? Should its use be restricted and, if so, how?

(answer 3 h) since the USD is vehicle currency, final settlement from offshore USD clearing system may be more important issue to be operated 24/7/365.

i. Are there specific areas, such as liquidity management, interoperability, accounting processes, or payment routing, for which stakeholders believe the Board should establish joint Federal Reserve and industry teams to identify approaches for implementation of a 24x7x365 RTGS settlement service?

(answer 3 i) I don't know. All (liquidity management, interoperability, accounting processes, and payment routing) are important issues. But it may not be necessary to be discussed together with faster payment system development.

4. Should the Federal Reserve develop a liquidity management tool that would enable transfers between Federal Reserve accounts on a 24x7x365 basis to support services for real-time interbank settlement of faster payments, whether those services are provided by the private sector or the Reserve Banks? Why or why not?

(answer 4) In many countries, money market is not active during night time. As such, there is less incentive to open current account exposing central bank money to risk opening the accounts during night time. I would rather choosing opening the current account only daytime. During night time, switching information (messages) by using sender net debit cap backed by cash collateral, which is safer and more efficient.

Having said that, US market may be exceptional. One of the most active and liquid markets in the world which could foster night market for the rest of the world.

5. If the Reserve Banks develop a liquidity management tool,

a. What type of tool would be preferable and why?

- i. A tool that requires a bank to originate a transfer from one account to another
- ii. A tool that allows an agent to originate a transfer on behalf of one or more banks
- iii. A tool that allows an automatic transfer of balances (or “sweep”) based on pre-established thresholds and limits
- iv. A combination of the above
- v. An alternative approach

(answer 5 a) I would prefer “i. A tool that requires a bank to originate a transfer from one account to another “. Also, just “camt” messages may be simple and sufficient for cash management.

b. Would a liquidity management tool need to be available 24x7x365, or alternatively, during certain defined hours on weekends and holidays? During what hours should a liquidity management tool be available?

(answer 5 b) As already mentioned, in many countries, money market is not active during night time. Also, it will not be difficult to estimate necessary liquidity during night time, which may be core competence of banks. As such, estimating optimum sender net debit cap is under the discretion of each bank.

I believe liquidity management will be necessary during daily operating hours of RTGS will be sufficient.

c. Could a liquidity management tool be used for purposes other than to support real-time settlement of retail faster payments? If so, for what other purposes could the tool be used? Should its use be restricted and, if so, how?

(answer 5 c) In our case, liquidity management may move balance from current account to cash collateral account, which is not very difficult as an example. I am not sure whether you need specific application for cash management. I would rather use ISO 20022 cash management messages (I am

not sure).

6. Should a 24x7x365 RTGS settlement service and liquidity management tool be developed in tandem or should the Federal Reserve pursue only one, or neither, of these initiatives? Why?

(answer 6) I don't know. I don't understand why liquidity management tool is so difficult to develop. Transferring balance between a variety of accounts (main a/c, sub a/c, collateral a/c, rtgs a/c, home a/c, etc.) may not be a special issue.

Liquidity management tool (whatever it may be) will be necessary from the beginning of the operation of the Rapid retail (faster) payment.

Since RTGS system has extremely important current account database, it will be more difficult to operate 24/7/365 compared to such operation of switch type faster payment. Also, RTGS system may need to process daily batches for such database.

7. If the Federal Reserve pursues one or both of these actions, do they help achieve ubiquitous, nationwide access to safe and efficient faster payments in the long run? If so, which of the potential actions, or both, and in what ways?

(answer 7) In order to help to achieve ubiquitous; nationwide access to safe and efficient faster payment will be dependent on how the participants can or will deploy their services nationwide. From this perspective, we are planning to connect MFSPs (mobile financial service providers) directly to the Rapid retail (faster) payment switch, though MFSPs will need to use banks current account for DTNS (designated time net settlement) and for "Trust account". MFSP services will be helpful for achieving ubiquitous, nationwide access. Could you refer to the reference material attached for more specific flow, please?

8. What other approaches, not explicitly considered in this notice, might help achieve the broader goals of ubiquitous, nationwide access to faster payments in the United States?

(answer 8) I admire that Reserve Banks are coordinating almost all stakeholders. I do believe your project will be successful providing ubiquitous nationwide access by getting so many approaches from stakeholders.

9. Beyond the provision of payment and settlement services, are there other actions, under its existing

authority, the Federal Reserve should consider that might help its broader goals with respect to the U.S. payment system?

(answer 9) I don't know. If possible, I would like to discuss global common digital currency by cooperating with central banks and government authorities including international organizations.

Note: thank you so much for your kindly reading this written by my poor English up to here.

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Outline of CBM-NET Enhancement preliminary draft and prepared for discussions v23

December 2018

This PowerPoint slides are made solely for discussion purposes. Views expressed are those of the presenter and do not necessarily reflect any official view of CBM, JICA, ADB, or any other organizations.

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1. Basic policy and concept

New CBM-NET to be;

- (1) user-friendly payment and settlement system for financial institutions in Myanmar
- (2) central bank business infrastructure for financial markets in Myanmar
- (3) Financial market infrastructure (FMI) with interoperability connecting other FMIs globally and fostering market activities in ASEAN and ASEAN+3 in the future
- (4) one of the best payment and settlement infrastructures globally; and
- (5) compliant with Principles for Financial Market Infrastructures (PFMI)

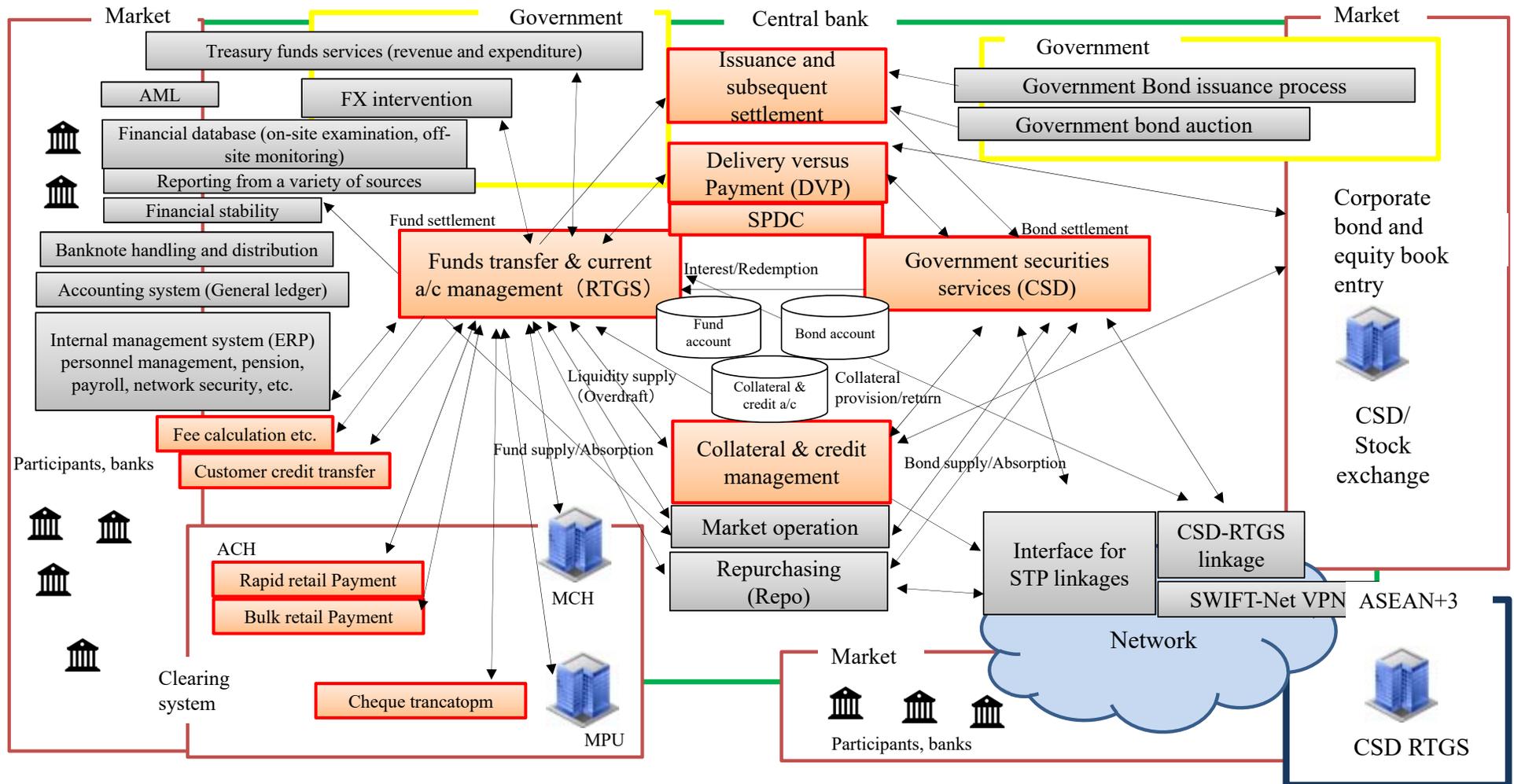
New CBM-NET will;

- (1) fully utilize the state of the art technologies
- (2) adopt international standards in particular ISO20022
- (3) respect domestic market practices in Myanmar financial markets when it is beneficial for the participants, and
- (4) provide secure and reliable services to participants

2. Outline of New CBM-NET

- (1) CBM-NET is the high value payment system (HVPS) providing final settlement of Myanmar kyat (MMK).
 - Funds transfer service (FTS) with real time gross settlement (RTGS)
- (2) CBM-NET is the central securities depository (CSD) for Myanmar government bond
 - Book-entry system for T-bond/bill
- (3) CBM-NET provides collateral and credit management service with intraday overdraft facility.
- (4) CBM-NET provides retail payment service such as automated clearing house (ACH) with both bulk retail payment and rapid retail payment and check truncation system, etc.

Bond market infrastructures and related systems (possible generic model for central banks)



Note: there are differences economy by economy, central bank by central bank, and CSD by CSD. This is just a possible case and preliminary draft which needs to be improved and revised.

Types of payment and way of settlement (tentative)

High-Value Payment	By CBM	1. CBM transactions: deposit/withdrawal of banknote and check/bill etc.	RTGS	Settlement by CBM
		2. T-bond/bill transactions: cash leg of DVP including SPDC		
		3. Interbank transactions: funds transfer between participants		
Retail Payment	By CBM	4. CCT: funds transfer for customers, queued with LSF	DTNS	
		5. Rapid retail payment: almost real time payment between customer accounts (ACH)		
		6. Bulk retail payment: payment such as payroll, utility, pension, etc. (ACH)		
		7. Cheque truncation: conversion of physical cheque to electronic image and digital data		
	By MPU	8. MCH: Physical cheque clearing and settlement		
		9. ATM transactions		
		10. Card/POS transactions		
		11. Transactions between PSPs including mobile payment		

CBM: Central Bank of Myanmar, MPU: Myanmar Payment Union, DVP: delivery versus payment, SPDC: simultaneous processing DVP and collateralization, CCT: customer credit transfer, LSF: liquidity saving features, ACH: automated clearing house, MCH: mechanized clearing house, ATM: automated teller machine, POS: point of sales, PSP: payment service provider 6

Possible Payment and Settlement Functions for CBM-NET

1. CBM transactions for deposit/withdrawal of banknote and check/bill
 - Considering the nature of the businesses, deposit/withdrawal of banknotes and checks/bills are to be settled directly using current account in CBM-NET.
2. Cash leg of DVP settlement of T-bond/bill transaction
 - Considering that T-bonds/bills are not liquid, cash leg of DVP settlement is not supposed to be waiting in a queue. As such, the cash leg needs to be settled directly using current account in CBM-NET.
3. Interbank transactions (bank transfers)
 - Interbank transactions are subcategorized into two types, which are transactions without queuing or transaction with queuing for liquidity saving features (LSF). Urgent transactions are settled directly at RTGS account. Also, in order to settle bank transfers with minimum liquidity (less balance in the accounts), RTGS with LSF will be used. When there is not sufficient amount of balance in the account, the transaction needs to wait in a queue. The queued transactions may be settled by bilateral offsetting and/or multilateral offsetting.
4. Customer credit transfers (CCT)
 - In order to settle customer transfers with minimum liquidity (less balance in the account), RTGS with LSF will be used for CCTs, too. When there is not sufficient amount of balance in the account, the transaction needs to wait in a queue same with the interbank transactions with queuing for LSF. The queued transactions may also be settled by bilateral offsetting and/or multilateral offsetting.

Possible Payment and Settlement Functions for CBM-NET

5. Rapid retail payment transactions (ACH)
 - Rapid retail payment transactions will be processed by switching the transactions to receiving banks in a real time base. Payment messages can be sent real time basis to receiving banks. The messages are switched to receiving bank instantly and cleared using clearing accounts. Cleared balances will be settled by designated time net settlement (DTNS).
6. Bulk retail payments (ACH)
 - Bulk retail payments are processed by switching the transactions to receiving banks. Bulk payments for payroll, utility, pension payments, etc. will be processed and can be sent and received by file transfer. Future dated transaction can also be handled. The messages are switched to receiving bank and cleared. Cleared balances are settled by DTNS.
7. Cheque truncation transactions
 - Physical cheques are converted to electronic images and digital data. Electronic images are sent to issuing banks. Digital data are cleared and their net positions are settled by current accounts as DTNS.
8. Mechanised clearing house (MCH)
 - Physical cheques are cleared and net positions of participant banks are settled at a cut off time (DTNS which is same as current procedure).

Possible Payment and Settlement Functions for CBM-NET

9. ATM transactions

- Net position of participant banks are calculated by MPU and settled using current accounts of CBM-NET (same as current procedure adopted for ATM transactions through MPU).

10. Card/POS transactions

- Net position of participant banks are calculated by MPU and settled using current accounts of CBM-NET (same as current procedure adopted for ATM transactions through MPU).

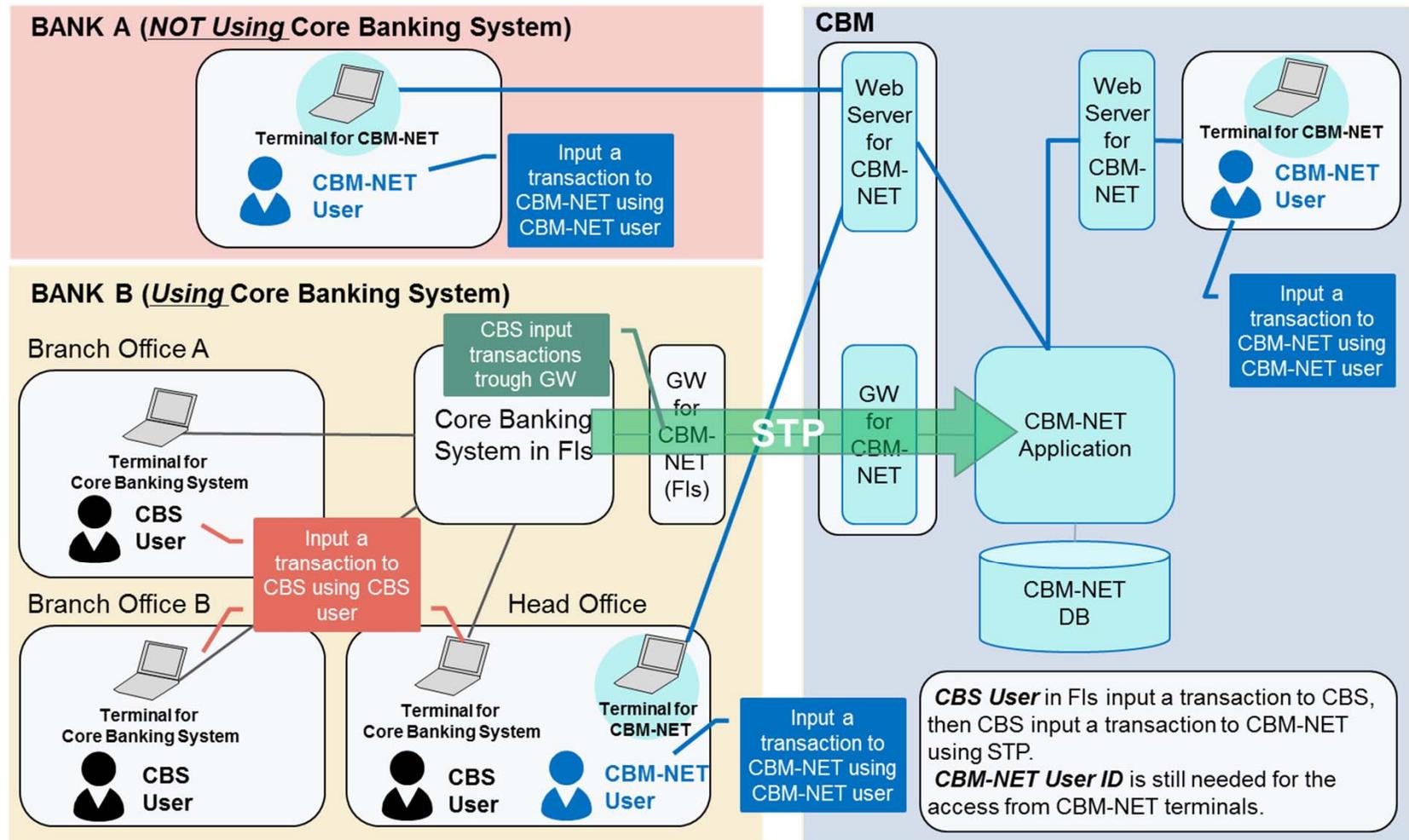
11. Transactions between PSPs including mobile payment

- Net position of participant banks are settled at a cut off time (to be considered).

3. Specific functions and features

- (1) Direct connections with participant core-banking systems (CBS) using widely accepted technologies and international standards to have better interoperability
 - Straight through processing (STP) with participants
- (2) Adoption of international standards ISO20022
- (3) Liquidity saving features (LSF) adopting queuing and offsetting
- (4) Simultaneous processing and DVP and collateralization (SPDC)
- (5) Automated clearing house (ACH) functions such as (i) bulk retail payment and (ii) rapid (instant) retail payment with capability to enhance new payment instruments
- (6) User-friendly user interfaces such as alert and dashboard functions

(1) Direct connections of CBM-NET with participant core-banking systems (CBS)



source: JICA, MRI, and Promontory

Straight through processing (STP) with participants

(2) Adoption of international standards ISO20022

In order to implement straight through processing (STP) between CBM-NET and CBS of participants, standards and communication protocols widely accepted globally (in particular ASEAN and ASEAN+3) with better interoperability having characteristics such as extensibility, neutrality, and independence are adopted.

Following international standards are adopted to secure interoperability between CBM-NET and financial institutions (FIs).

ISO 20022 for message standard (to be explained later)

ISO 9362 (BICFI) for financial institution identification

ISO 6166 (ISIN) for securities numbering

ISO 3166-1 for country code, and

ISO 4217 for currency code

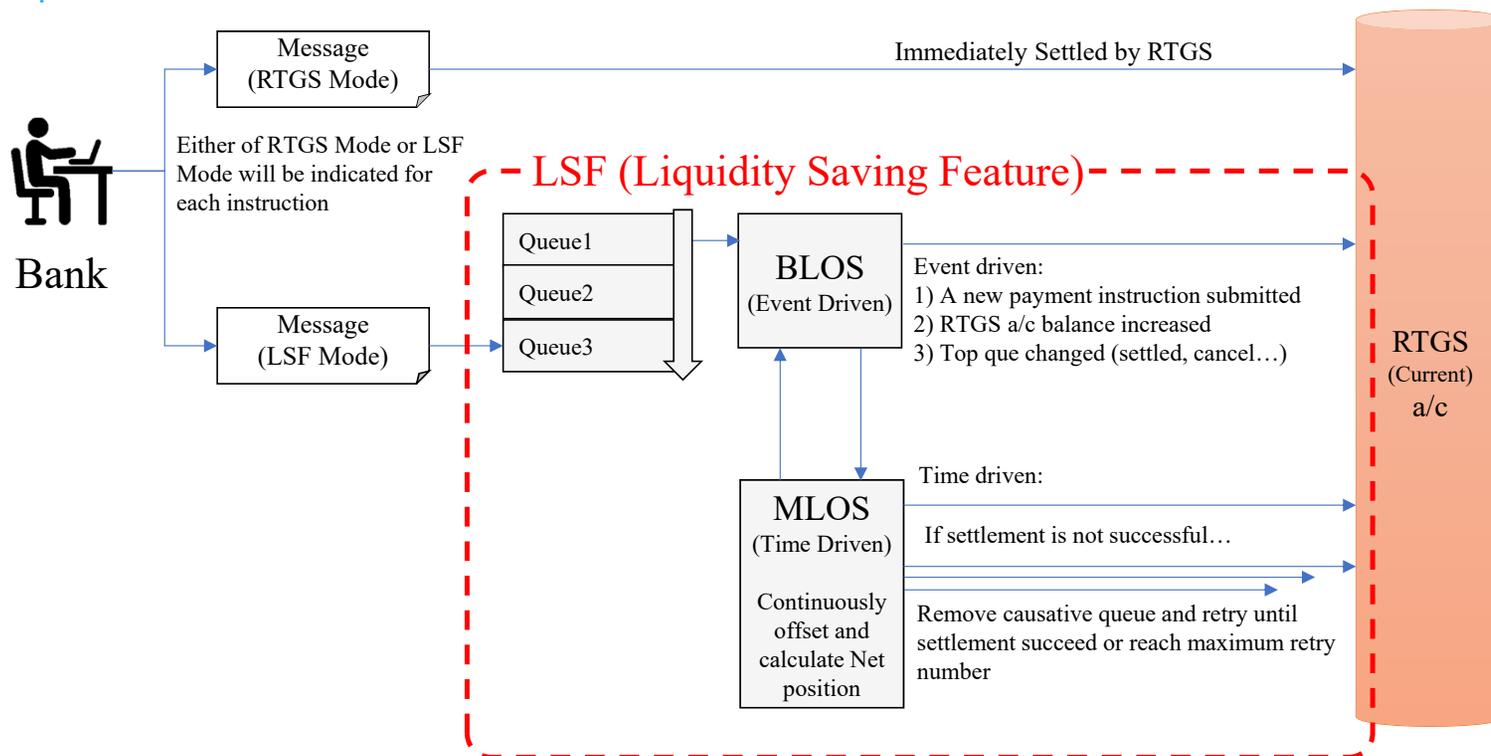
With respect to communication protocol,

SOAP/XML is adopted.

Note: BICFI: Business Identifier Code for Financial Institution, ISIN: International Securities Identification Number, SOAP: originally Simple Object Access Protocol, XML: Extensible Markup Language

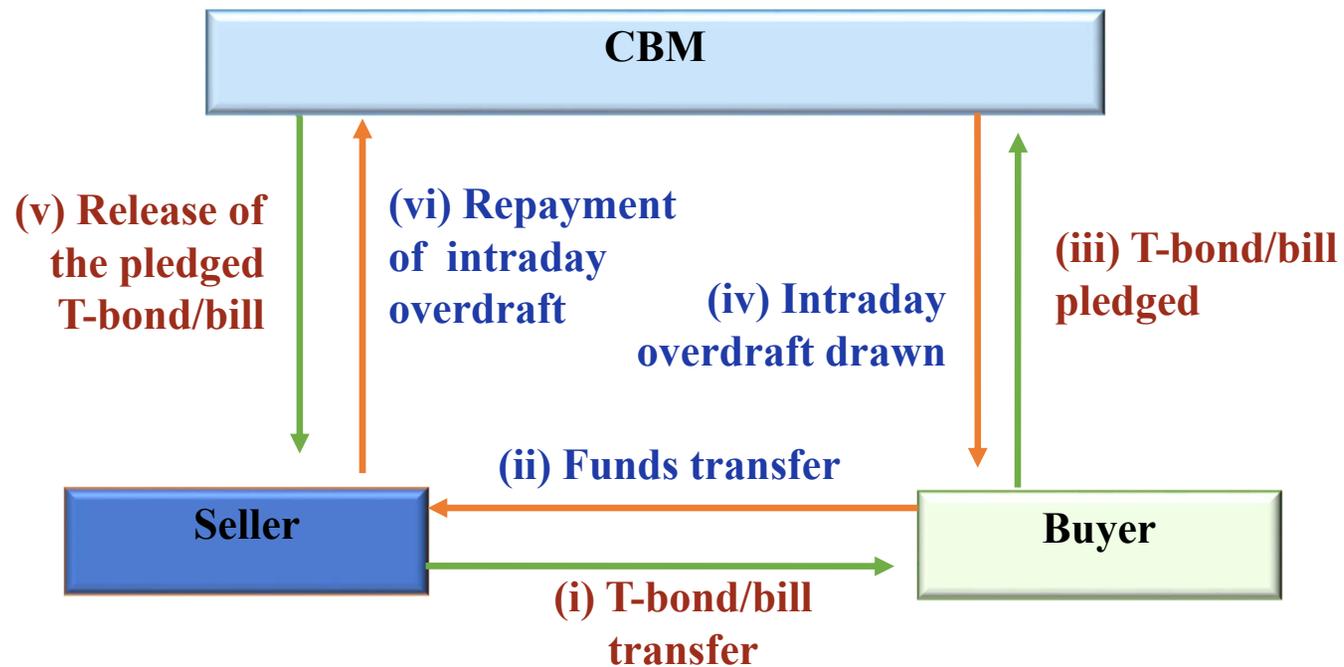
(3) Liquidity saving features (LSF) adopting queuing and offsetting

- LSF will process Payment Instruction Message which designated to settle by LSF mode.
- LSF settlement will be conducted on RTGS (current) account.



* All type of settlement such as RTGS or LFS(BLOS, MLOS) will be processed one by one. Waiting settlement will be held (not be rejected).

(4) Simultaneous Processing of DVP and Collateralization (SPDC)



The six processes from (i) to (vi) are processed simultaneously, which saves liquidity for settlement significantly.

(4) Simultaneous Processing of DVP and Collateralization (SPDC)

Purpose and benefit

- SPDC (Simultaneous Processing of DVP and Collateralization), which has been introduced among especially developed countries, is a kind of functions for saving the settlement liquidity to buy T-bond.
- SPDC worked efficiently and effectively when the global financial crisis happened around 2008. More specifically, the financial market which had FMI with this application didn't have serious liquidity shortage and stayed relatively calm without financial problems of brokers and banks.
- Later, other financial markets such as European and Hong Kong markets are trying to implement this kind of application to have better liquidity saving facility.
- This will also contribute to foster secondary market of T-bond/bill.

Functions

- SPDC allows T-bond buyer to provide T-bond/bill that will be received from T-bond seller as collateral for an intraday overdraft from CBM and simultaneously use the funds drawn to pay the seller.
- SPDC is also called in-transit collateral (ITC).

SPDC is useful tool for FIs to process DVP with less settlement liquidity.

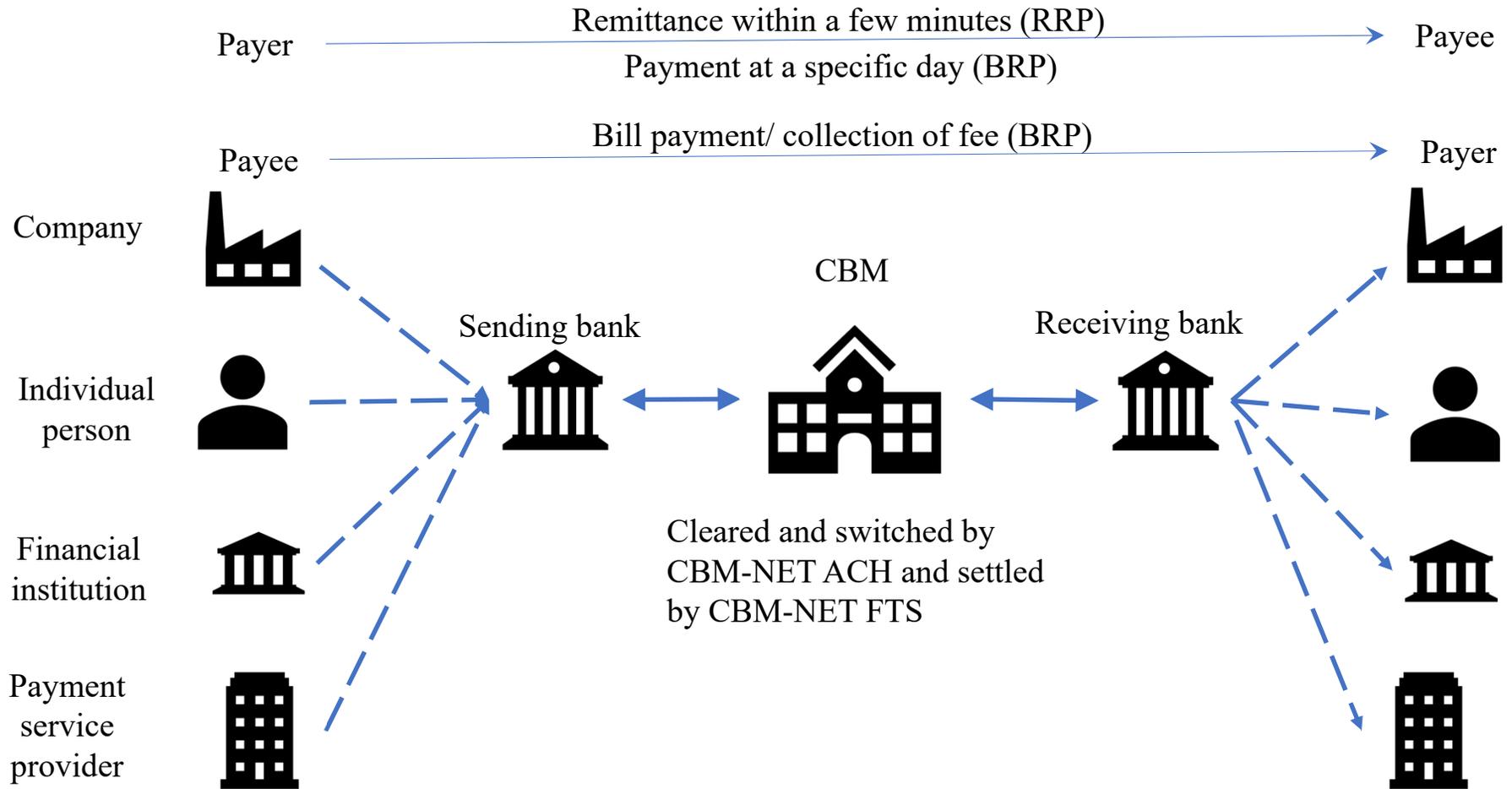
(5) Automated Clearing House (ACH)

Facilitating automated clearing house (ACH) functions such as

- (i) bulk retail payment (BRP) for such as payroll, pension, tax, utility payment, and so on.
- (ii) rapid (instant) retail payment (RRP) with capability to enhance new payment instruments

Retail payment services (ACH)

BRP: bulk retail payment
RRP: rapid retail payment

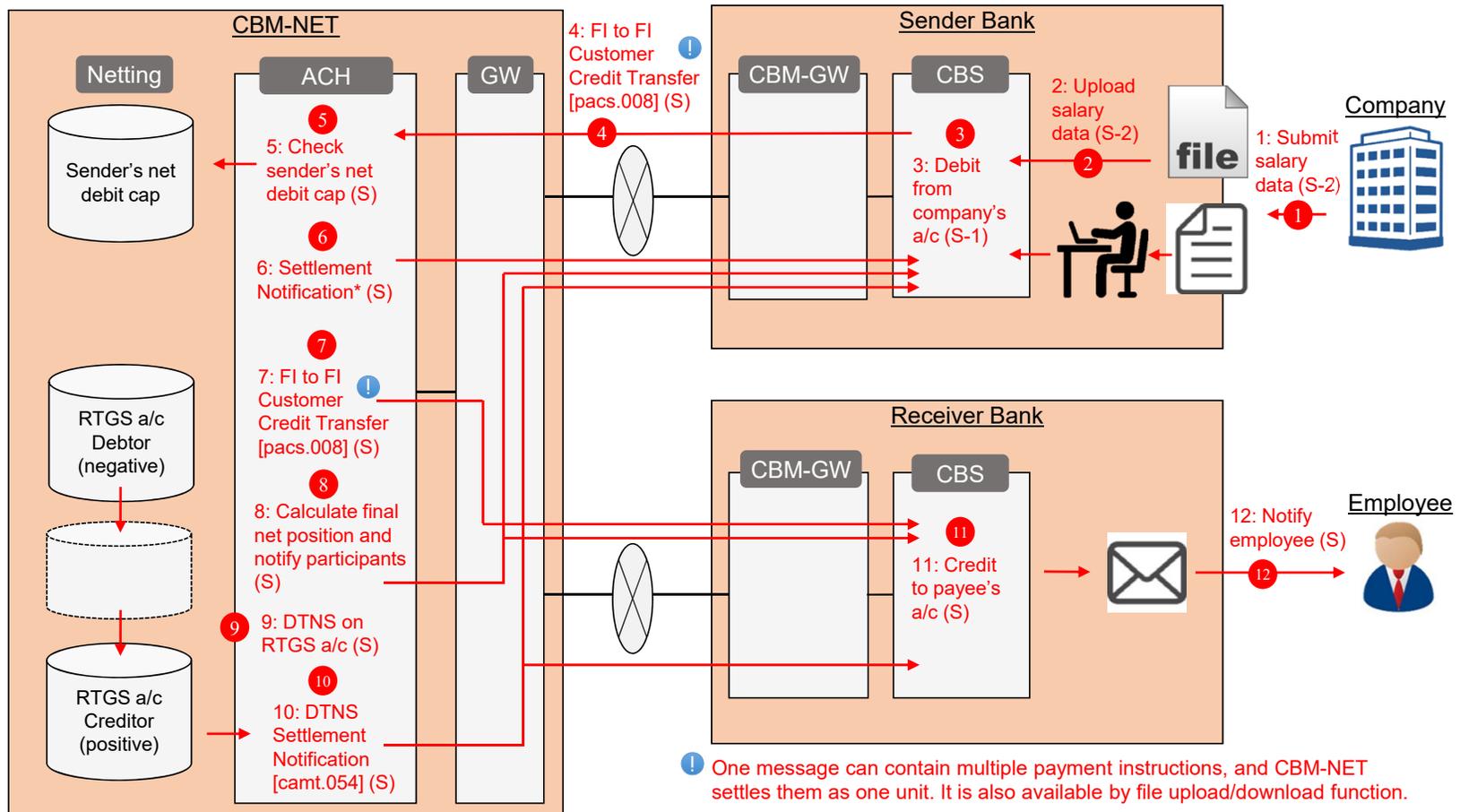


Rapid retail payment with bulk payment services

1. A company can send bulk payment data such as a file containing payroll data to a sending bank. The sending bank calculate the total amount of the payroll messages and debit the amount from the account of the company opened in the sending bank. The sending bank sends the file to CBM. CBM saves the file containing credit instruction messages to individual employees of the company until the processing day. On the processing day, the individual messages are switched to receiving banks as well as recorded to clearing accounts to calculate the balances in a real time basis. The participants (the banks) can retrieve their own balances including message items in a real time basis from CBM-NET terminals and know their possible positions. Receiving banks credit the salary amounts to individual the company's employees' accounts opened in the receiving banks instantly. At a certain cut-off time specified by CBM, the net balances of the clearing accounts are settled by CBM-NET FTS (designated net settlement). Risk management measures are implemented in line with other measures for the settlement of netted balances from MCH and MPU.
2. A company can send rich data such as trade data with ISO 20022 (XML) format to sending bank together with payment data. The sending bank processes the data with same way explained above.
3. Individual persons can remit money instantly to a person who hold an account in a receiving bank. The message sent from sending bank to CBM is to be processed instantly. The message is switched to the receiving bank in which the payee opens account as well as recorded to clearing accounts for designated net settlement at the cut-off time. In case of future dated payment, the message is to be saved in CBM-NET until the specified processing day.
4. Financial institutions can get same services with companies and individual persons as well as on behalf of them.
5. Payment service providers can be connected with the sending banks and receiving banks in order to process their messages including new types of payment instruments. Detailed interface needs to be discussed during design phase.

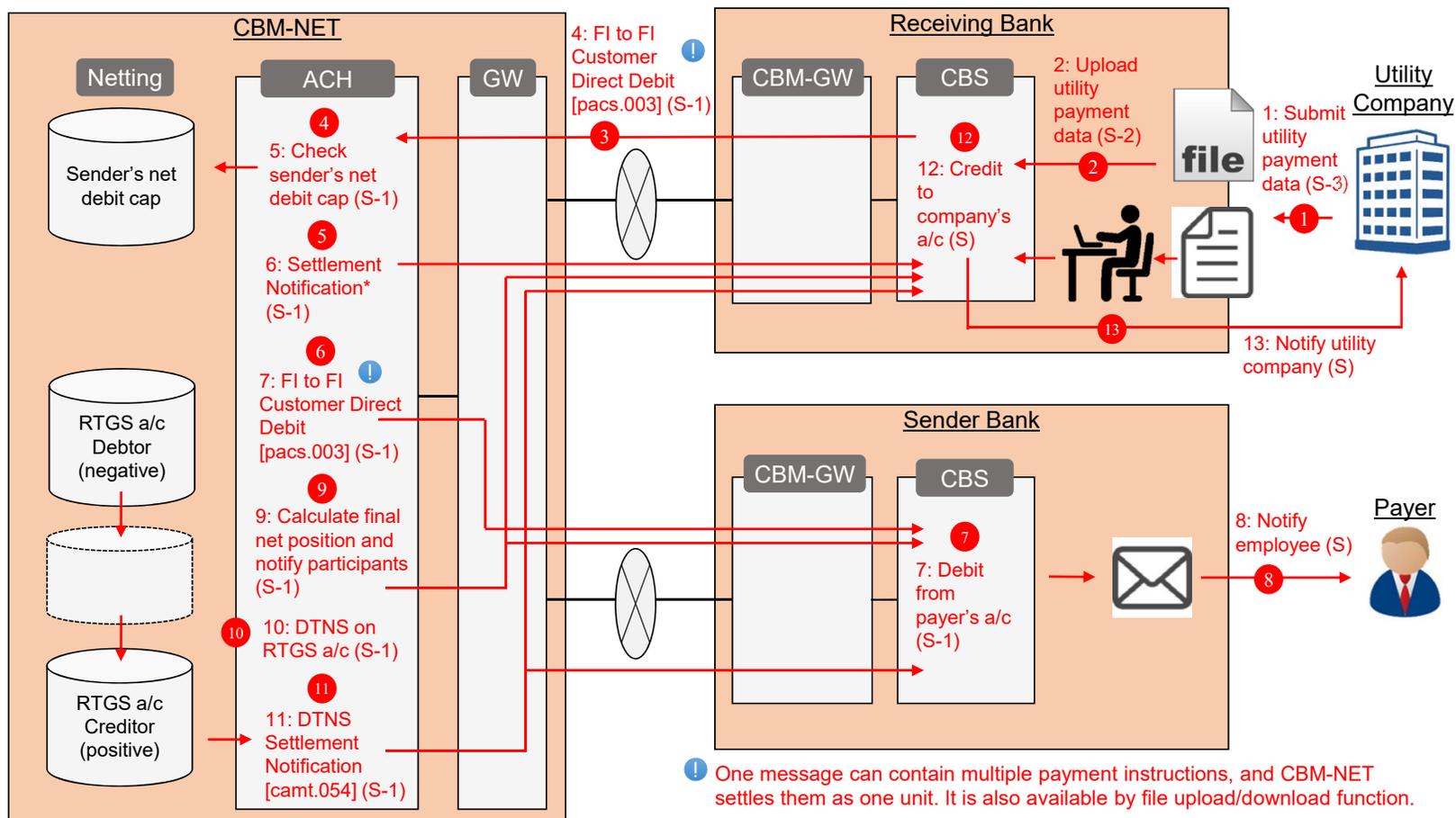
Remaining challenges need to be identified and discussed by stakeholders.

Bulk retail payment: direct credit (interbank payroll)



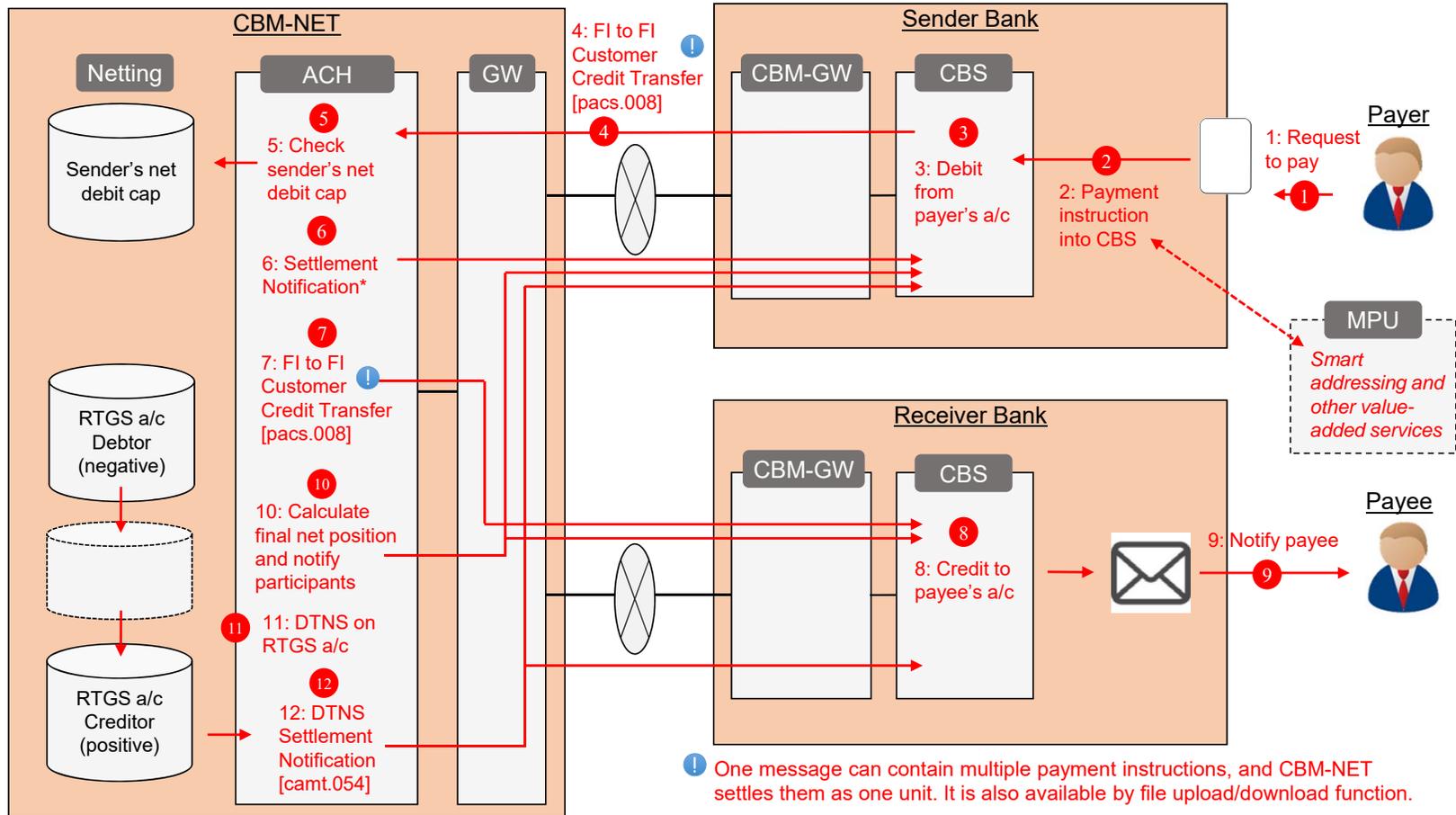
source: JICA, MRI, and Promontory

Bulk retail payment: direct debit (utility payment)



source: JICA, MRI, and Promontory

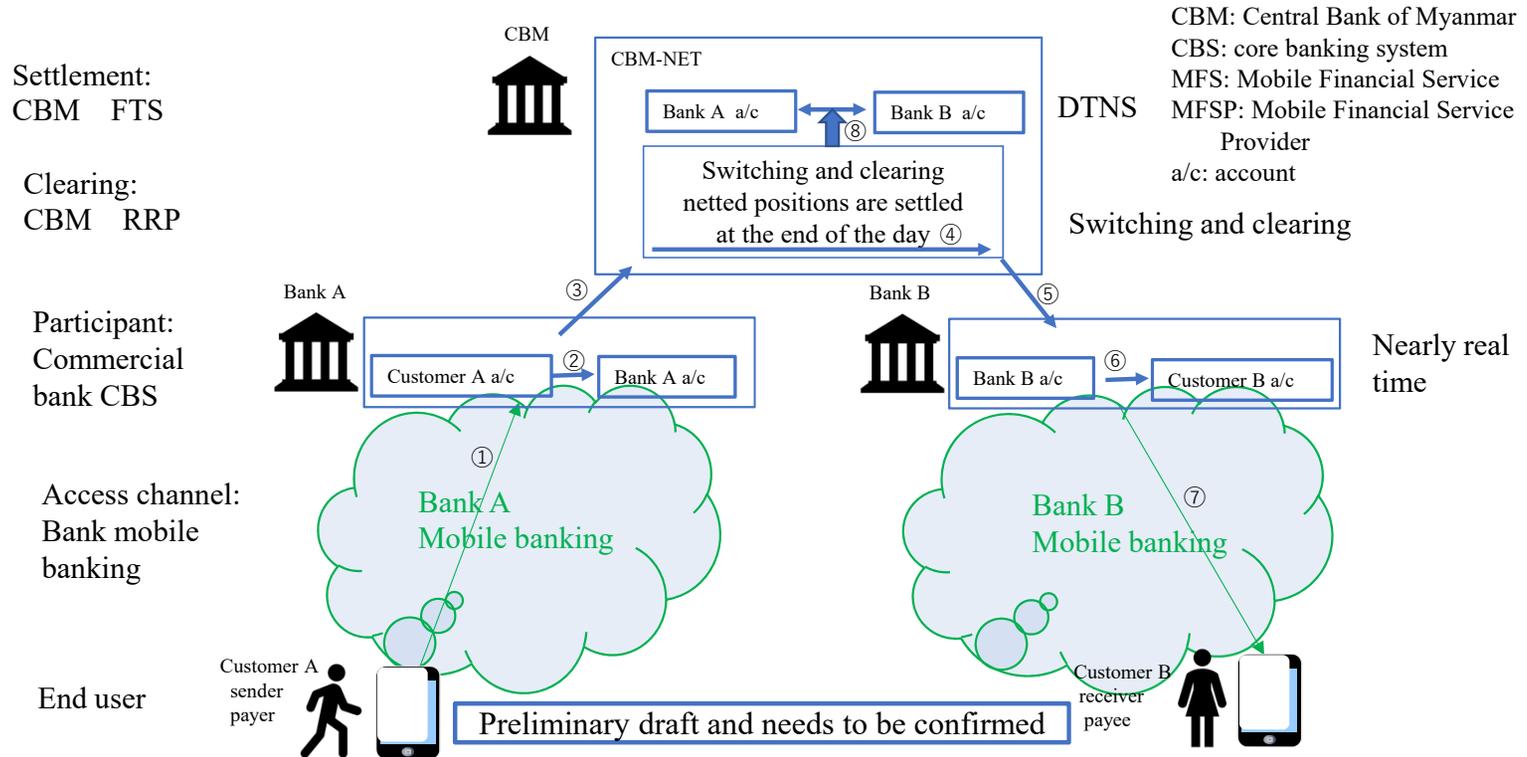
Rapid retail payment: same as direct credit



source: JICA, MRI, and Promontory

RRP (Rapid Retail Payment)

Mobile Banking: Customer A having an account at Bank A transfer funds to Customer B having an account at Bank B through mobile banking of each bank (RRP of CBM-NET is used)



Mobile Banking: Customer A having an account at bank A makes payment for goods purchasing from merchant having an account at bank B through mobile banking (RRP of CBM-NET is used)

CBM: Central Bank of Myanmar
 CBS: core banking system
 MFS: Mobile Financial Service
 MFSP: Mobile Financial Service Provider
 a/c: account

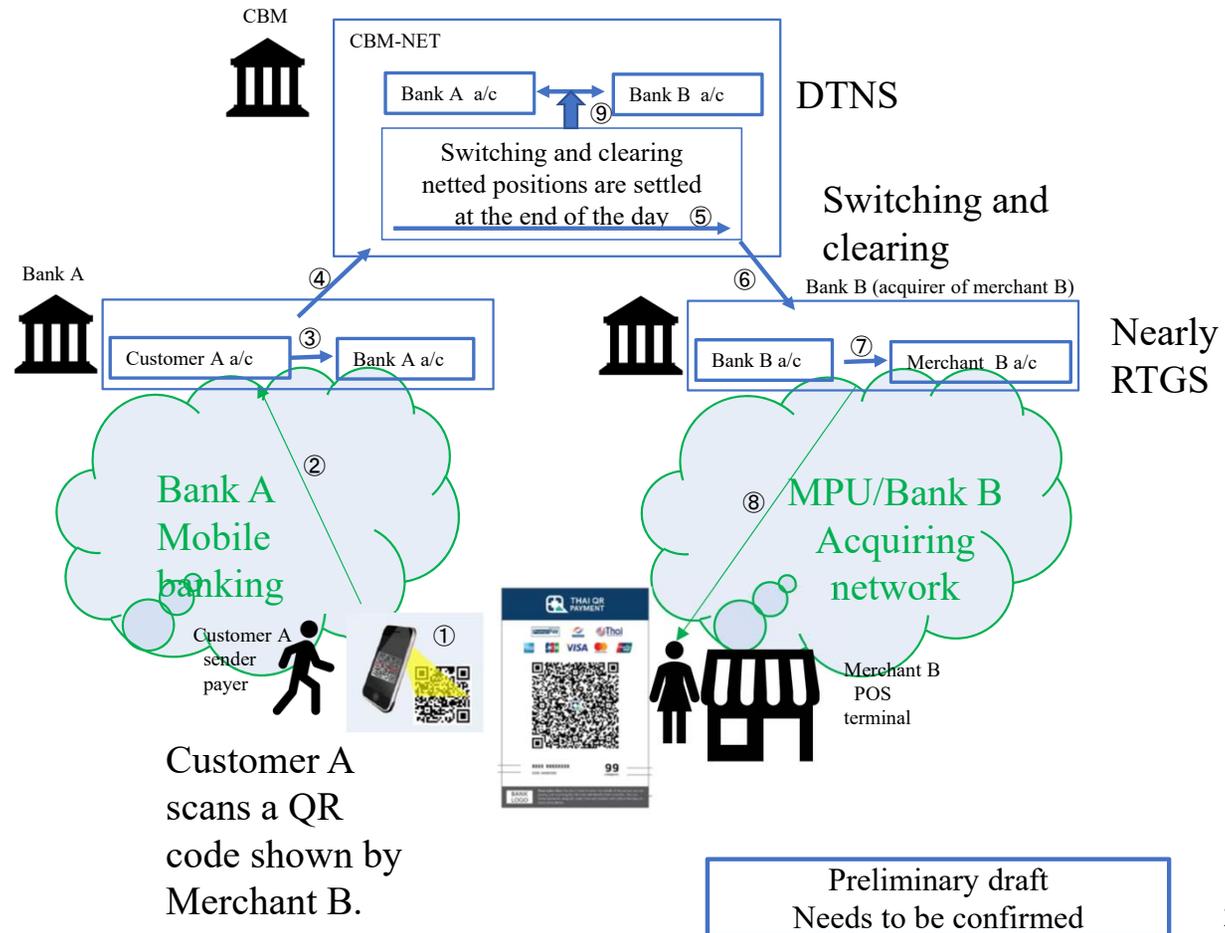
Settlement:
 CBM FTS

Clearing:
 CBM RRP

Participant:
 Commercial
 bank CBS

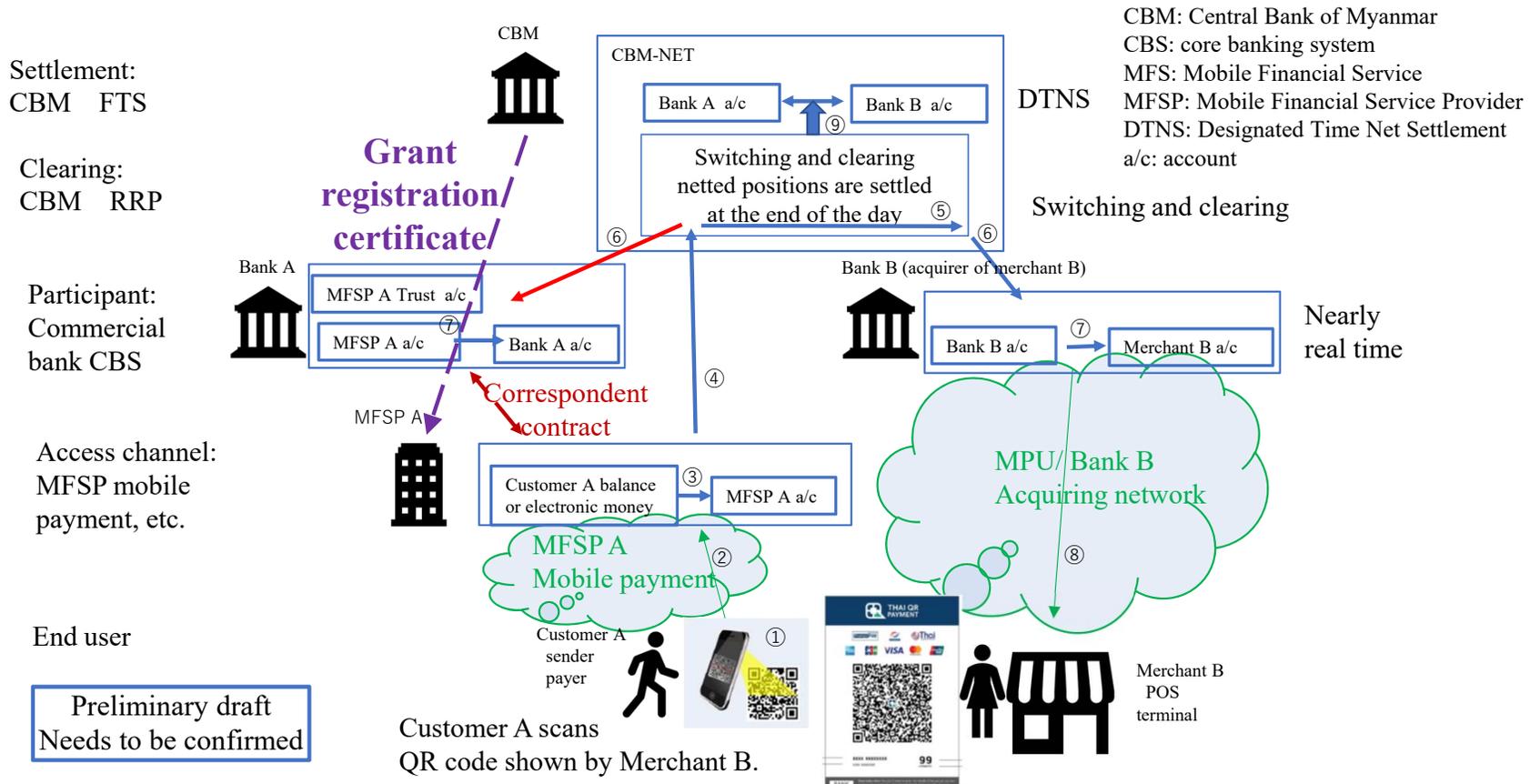
Access
 channel: Bank
 mobile banking

End user



RRP (Rapid Retail Payment)

Mobile payment: Customer A having some mobile phone balance or mobile (electronic) money issued by MFSP A transfers the balance or mobile money to MFSP A in order to pay to Merchant B having an account at Bank B through the MFSP A which will be an indirect account participant of CBM-NET (RRP of CBM-NET is used)

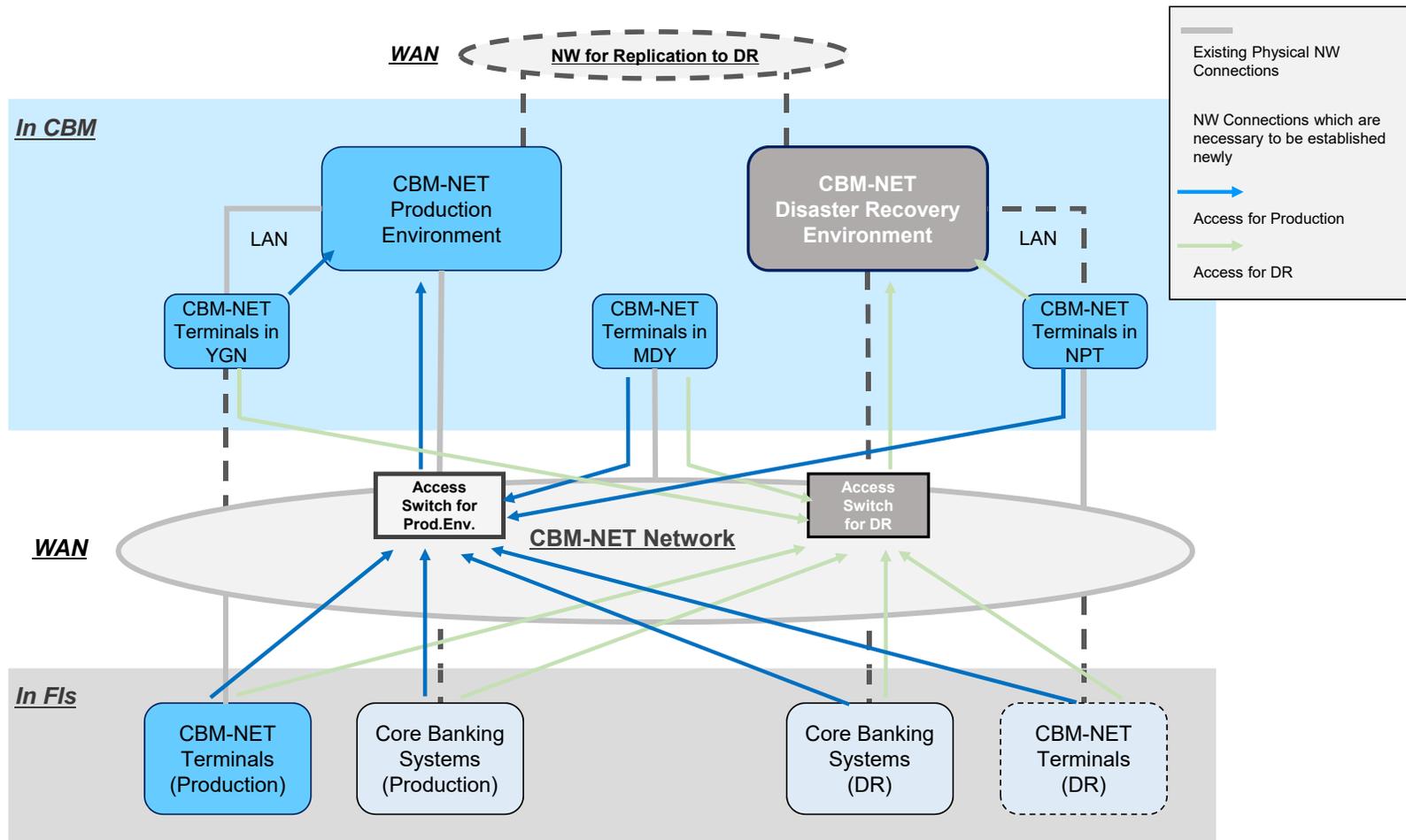


- (6) User-friendly user interfaces such as alert and dashboard functions
- (i) User-friendly alert function provides warning or information to both CBM and FIs for their transactional data monitoring.
 - (ii) Dashboard function displays operational data and financial data using charts and graphs for easy glance to both CBM and FIs.
 - (iii) Interfaces with other applications will also be implemented.

4. Back-up and disaster recovery facility

- (1) Hot standby facility is implemented at the main site.
- (2) Realtime (asynchronous) remote backup facility will be implemented at remote site about 300 km from the main site.
- (3) Targeted Recovery Point Objective (RPO) and Recovery Time Objective (RTO) will be as follows.
 - (i) RPO: Near-zero (This may vary depending on the quality of network connection)
 - (ii) RTO: 2 hours (The more precise RTO will be examined after the verification of recovery procedures.)

An image of disaster recovery facility



Network will be configured to deny access to CBM-NET servers in DR site from FIs and CBM branches.

5. Tentative Timeline of the Project

	2018		2019				2020					
	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q		
CBM-NET System Development	Grant Agreement	External Design	Detail Design	Internal Design	Installation	Integration Test	System Test	UAT	RT #1	Cut Over#1	RT #2	2nd Group
FIs Coordination		Call for Cooperation	System API	New Service		Function Usage	Preparation for Connection/Running Test					

Target of CBM-NET2 Go Live is 3Q of 2020

Call for cooperation to Fis	Nov. 2018
Announce the new system and disclose API	Jan. 2019
Announce the new service	Jun. 2019
Announce the system function and usage	Nov. 2019
Connection test (1st group)	Jan.-Mar. 2020
Running test (1st group)	Jun.-Aug. 2020

6. Conclusions and acknowledgements

Completing definition of user requirements for CBM-NET enhancement project, it is expected that the project will start from fiscal 2018 and production operation of new CBM-NET will start in 2020. The new CBM-NET will be one of the most advanced payment and settlement infrastructures providing full fledged services. Having said that, it is recommended that possible remaining challenges such as development of deep and liquid financial markets including sound market practices be addressed.

Taking this opportunity, JICA CBM Experts would like to express their heartfelt gratitude to CBM top management Governor U Kyaw Kyaw Maung, former Deputy Governors U Maung Maung Win and U Set Aung (currently Deputy Ministers of Ministry of Planning and Finance), and Deputy Governor U Bo Bo Nge for their instructions leading the project as well as Director General Daw Myint Myint Kyi for her managing the project to be successful. CBM officers have been kindly cooperating with JICA CBM Experts very much.

In completing the user requirements consultant team consists of Promontory, IBM, and OPAC, coordinated by MRI contributed very much. Also, Japanese Government, JICA Headquarter as well as Embassy of Japan in Myanmar, JICA Myanmar Office, and other stake holders strongly supported and guided the project. Taking this opportunity JICA CBM Expert Team would like to express our heartfelt gratitude to all the stakeholders for their kind help and advices.

Thank you

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