

GSMT Approach for Off-Line use of Retail CBDC

Retail CBDC is intended to complement physical cash for consumers and merchants. One of the main reasons for CBDC is that banknotes and coins only exist off-line. However, an important question about the digital equivalent of banknotes is whether it will only be available on-line.

Enabling off-line Retail CBDC transactions is possible with a combination of technical and business process steps as part of the overall design of the CBDC architecture.

Electronic payments have been faced with the challenge of facilitating payments while isolated from centralized systems ever since card processing over phones lines at the point of sale (POS) became common. Merchants were able to choose to use manual processing for times when the POS authorizing service was unavailable. This business process solution to the lack of immediate payment authorization allowed the merchant to conduct

business while accepting a certain level of credit exposure risk for the merchant.

Similar risks will exist for payments using Retail CBDC, but a combination of technical and business process solutions can provide protections within certain levels of risk for merchants and users. Off-line capabilities will extend the access for Retail CBDC to circumstances where immediate network connectivity is not available by allowing proximity transactions, with some limitations, to still operate. This will provide off-line capabilities for peer-to-peer use cases without any network connection for either party.

The primary tradeoff that must be balanced includes:

- **Enabling proximity payments off-line:** peer-to-peer transactions are important use cases to cover in conditions with no network connectivity.
- **Managing the risks for security and double-spending:** It is critical to ensure that appropriate controls are in place to avoid creating new security risk areas and to protect against the same currency being used in more than one transaction.

Giori Digital's GSMT Enables off-line transactions.

Giori Digital's **Global Solutions for Money Technology (GSMT®)** provides custody of User Wallets as a centralized function within the set of Global eNote Manager (GEM) platforms. These wallets contain the signed, fungible eNotes which represent the CBDC denominations issued by the central bank. Normally, these eNotes are exchanged

between User Wallets during the execution of transactions and payments are settled with finality in real time.

On-line access through the GEM API to external payment systems allows for interoperability with payment systems as well as more advanced transactions capabilities. Giori Digital also provides an optional GWA wallet application for smartphones which provides the interface for the user to manage their wallet and issue transaction instructions.

GSMT has integrated an off-line solution in partnership with WhisperCash™ that enables users to make Retail CBDC transactions while offline.

GMST also allows for **direct peer to peer proximity** offline payments. This is available through the integration of the WhisperCash™ solution that provides a stored value card which the User can load with value that is transferred from their GSMT User Wallet.

Managing the risks for security and double-spending:

An important key to implementing an effective off-line solution is integrating the solution with business process rules that limit risk for the user and all participants in the transaction. Together, the off-line solution will include limitations on the size and number of transactions to be initiated while off-line.

Even in the older case of managing card payments without access to on-line authentication through a POS, there are business steps to limit the risk exposure for users and merchants. Card processors would allow merchants to queue transaction requests while off-line, but there were limits of transaction sizes. Similar rules can be applied for Retail CBDC off-line transactions also.

The integration of GSMT with WhisperCash™ includes business controls for the combined solution. The User is able to designate a limited amount of their GEM User Wallet to be designated for offline transactions. These funds are effectively “cashed-out” of their GSMT Wallet and made available on their own WhisperCash® card for use anonymously while off-line.

There are significant benefits to this type of an integrated solution with a centralized wallet structure such as GSMT with WhisperCash®.

- Transferring value from the User Wallet to a WhisperCash card creates a convenient payment method for peer-to-peer anonymous proximity payments
- Remaining eNotes in the User Wallet remain secure and available for other on-line transactions

- Unused value in a WhisperCash® card can be transferred back into the User Wallet in a GEM at any time
- Authorized institutions that operate the GEMs have the business control for the administration of the wallets and the transfer of funds to the WhisperCash® system or to integrate Retail CBDC to other services they offer

Off-line payments with Retail CBDC are a valuable option.

Giori Digital has developed a combined solution using GSMT and WhisperCash to provide a secure and convenient solution to provide peer-to-peer proximity payments while offline. This extends the GSMT solution to provide use cases for anonymous payments for greater privacy and accessibility without network connectivity.

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