Fast Retail Payment Systems

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In December 2014, a group of Australian financial institutions announced that funding had been secured for the next phase of the New Payments Platform (NPP), which will provide the capability for Australian consumers and businesses to make and receive payments in near to real time. The NPP is one example of a fast retail payment system, a number of which have been implemented in other countries in recent years. This article provides an overview of some of the features of fast payment systems and discusses the approach taken in the design of the NPP.

Introduction

On 2 December 2014, a consortium of Australian financial institutions announced that they had committed to funding the building and operation of infrastructure that will support a new fast retail payment system.[1] The new system, referred to as the New Payments Platform (NPP), will be a landmark change for the Australian payments system, bringing not just immediacy of retail payments, but a range of other advances that will improve convenience for consumers and provide potentially significant efficiency gains for businesses. The NPP is scheduled to be operational in 2017.

This development in Australia has not occurred in isolation. A number of other countries have implemented similar systems in recent years and many others now have such projects under consideration. This emerging trend provided a backdrop for the Reserve Bank's Strategic Review of Innovation in the Payments System, which was a catalyst for the current project (RBA 2012).

This article examines key features of the fast retail payment systems that have been developed around the world, providing some context for the development of the NPP in Australia.

Background

The ability to make payments in real time has been a feature of large-value payment systems for many years. Many countries implemented real-time gross settlement (RTGS) systems in the 1990s and early 2000s as a way of reducing risk arising from the large exposures that could otherwise build up when settlement of funds between institutions is deferred. These real-time systems are generally aimed at facilitating a relatively small number of large corporate and financial market transactions. However, advances in technology – in particular improved telecommunications, faster processing speeds and wide penetration of internet connectivity – mean that real-time payments can be extended to the high-volume, low-value payments used by consumers and businesses ('retail payments'). Systems implemented in a number of countries allow businesses and consumers to make and receive payments in near to real time, with close-to-immediate funds availability to the recipient. Fast retail payment systems can benefit end users of payments systems, and also payment providers themselves – for example, by replacing the use of relatively costly cheque payments with real-time transfers using a payment application on a mobile device.

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1 The announcement included the appointment of SWIFT to build and operate the NPP (see APCA (2014) and SWIFT (2014)).

In the *Strategic Review of Innovation in the Payments System: Conclusions,* released in June 2012, the Reserve Bank's Payments System Board (PSB) noted that some customer-facing innovations had benefited financial institutions and their customers. However, it also noted that market forces might not be sufficient to produce some innovations that are in the public interest, particularly those requiring collective effort to succeed (RBA 2012). To address these concerns, and recognising trends internationally, the PSB set out a number of 'strategic objectives' that included the ability for business and consumers to make and receive real-time retail payments. Other strategic objectives included the ability to: make and receive payments outside normal banking hours; send more explanatory information with a payment; and send payments without having to use full Bank State Branch (BSB) and account number details.[2]

Other countries that have not already progressed to fast retail payments have been considering very similar issues. For example, in the United States the Federal Reserve Banks commenced a consultation process in September 2013, sharing their perspectives on some key gaps in the payments system (The Federal Reserve Banks 2013). This consultation process was similar to the Reserve Bank's Strategic Review. In August 2014, the Federal Reserve Banks released a paper that suggested that building new infrastructure may be the best way to facilitate real-time payments.[3] Several industry task forces are planned to provide input on the process of speeding up transactions.

Fast Retail Payments

Fast retail payments can be thought of as payments that are available for use by the recipient a short time after the payment has been initiated by the sender – within minutes, or indeed seconds. This contrasts with many established retail payment systems that rely on batch processing where funds are made available on the next business day, or even several days later – particularly in the case of cheques.[4]

There are three steps within the payment process relevant for achieving fast payments – clearing, posting and settlement. First, following the initiation of a payment by the customer (payer), the exchange of payment instructions and the calculation of payment obligations between financial institutions (referred to collectively as 'clearing') need to be performed in real time. Many retail payment systems have tended to clear payments infrequently in batches, making timely receipt of funds by the payee impossible. Second, the recipient's financial institution must act on the payment instructions it receives in the clearing process to make funds available to the recipient ('posting') in near to real time. Finally, the payer's financial institution needs to 'settle' the funds owing to the receiver's financial institution for the payment. This typically occurs by transferring funds between accounts held by financial institutions at the central bank (Exchange Settlement Accounts in Australia's case).

Clearing and posting need to occur quickly for a system to be, in effect, a 'fast' system. However, settlement between financial institutions need not be completed before funds are made available to the recipient customer. There is therefore freedom for settlement to occur in a number of ways and indeed the fast retail payment systems implemented to date have taken varying approaches (see 'Features of Fast Retail Payment Systems' below).

While there have been significant developments in recent years, the concept of fast retail payments is not new. For example, Japan's Zengin Data Telecommunication System (Zengin System) was established in 1973. The development of fast payment systems has generally occurred in one of two ways: through the extension of existing

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2   In Australia, bank identifier codes are known as 'BSB numbers'; in other countries these are called bank codes, transit numbers and sort codes.

3   The Federal Reserve Banks conducted an assessment of international fast retail payment systems to identify potential options for improving the speed of payment systems in the United States (The Federal Reserve Banks 2014a).

4   As an example, Australia's Direct Entry system, which processes bulk payments (such as salaries and direct debits) as well as internet 'pay anyone' transactions, has traditionally made funds available on the following business day. In recent years, a number of banks have begun to make funds available on the 'same day'. Interbank settlement arrangements introduced in 2013 allow this to occur without financial institutions incurring overnight settlement risk.

infrastructures (such as high-value systems or real-time ATM infrastructure) to accommodate high-volume, fast retail payments, or through new purpose-built infrastructure.

In most cases, new specialised infrastructure has been adopted for retail payments, but there are examples of hybrid systems processing both high-value and retail payments. For example, Japan's Zengin System clears both high-value and low-value funds transfers in near to real time, but settlement arrangements vary with transaction size. Switzerland's Swiss Interbank Clearing (SIC) provides for near to real time clearing and settlement of high-value payments and some retail funds transfers. A range of other countries have introduced fast retail payment systems either as hybrid systems or as dedicated low-value systems since 2000 (Table 1). As discussed below, Australia's NPP system will rely on newly developed clearing infrastructure, with settlement occurring in real time through a new component of the Reserve Bank's high-value settlement system, the Reserve Bank Information and Transfer System (RITS).

Features of Fast Retail Payment Systems[5]

The fast retail payment systems implemented around the world are distinguishable from each other in a number of ways. As noted, settlement models vary significantly, but other features also differ. Of particular interest in an Australian context are the approaches taken to the areas identified as objectives by the PSB – hours of availability, the ease of 'addressing' payments and the capacity to transmit richer information with a payment. The latter is closely related to the form of payment messages adopted by the system, which in turn is significant for the adaptability and interoperability of systems.

Settlement

There are broadly two modes of settlement in payment systems – RTGS, where interbank obligations are settled one by one in real time, and deferred net settlement, where payments are netted and settled in a batch or batches. In systems using RTGS, the speed of settlement can range from

Table 1: Examples of Fast Retail Payment Systems Introduced since 2000

Country	System	Commencement
South Korea	Electronic Banking System (EBS)[a]	2001
Brazil	Funds Transfer System (SITRAF)[b]	2002
Mexico	Interbank Electronic Payment System (SPEI)[c]	2004
South Africa	Real-Time Clearing (RTC)	2006
United Kingdom	Faster Payments (FPS)	2008
China	Internet Banking Payment System (IBPS)	2010
India	Immediate Payment Service (IMPS)	2010
Sweden	Payments in Real Time (BiR)[d]	2012
Poland	Express ELIXIR	2012
Singapore	Fast and Secure Transfers (FAST)	2014
Denmark	RealTime24/7[e]	2014

(a) Also known as HOFINET
(b) Sistema de Transferência de Fundos
(c) Sistema de Pagos Electrónicos Interbancarios
(d) Betalningar i Realtid
(e) Straksclearingen
Sources: National Sources; RBA

5 The information about the features of fast retail payment systems in this article has been drawn from a range of sources including Andresen and Jensen (2014), the Association of Banks in Singapore (2014), Banco Central do Brasil (2014), Banco de México (2014), Bankgirot (2014), BIS (2011, 2012), CPMI (2014), Japanese Banks' Payment Clearing Network (2014), National Payments Corporation of India (2014), Nets (2014), PASA (2014), Payments Council (2014), SIX Interbank Clearing (2014) and Sveriges Riksbank (2013).

around one second up to a few minutes. In systems using deferred net settlement arrangements, the frequency of settlement batches can also vary, from a single batch at the end of the day to multiple batches during the day. Unlike clearing, fast settlement is not an essential component of a fast retail payment system.

In systems using deferred net settlement, settlement exposures can build up between financial institutions. While these exposures are typically small relative to the exposures that can arise in large-value systems, prudent risk management suggests the need for mechanisms to manage these exposures. Common methods that have been introduced in a number of countries include the holding of collateral against exposures and the use of debit caps, which prevent additional transactions once an exposure has reached a specified size. These mechanisms are not required with RTGS.

Fast retail payment systems with real-time settlement have been implemented in Mexico, Sweden and Switzerland. In Australia, the Reserve Bank has committed to build a dedicated service to facilitate real-time settlement of payments through the NPP. In some other systems, settlement arrangements are determined by the value of the transaction. Japan's Zengin System settles payments over ¥100 million (A$1 million) in real time, while payments under this threshold are settled on a net basis at the end of the day.

In systems that use deferred net settlement, the frequency of settlement cycles can range from daily to almost real time (Table 2). Korea's EBS has a next-day settlement cycle, while fast retail payment systems with multiple settlement cycles a day include Singapore's FAST, which has two cycles a day, and the United Kingdom's FPS, which has three cycles. South Africa's RTC has hourly net settlements during the business day, while Brazil's SITRAF system settles payment batches every five minutes.

Availability outside traditional banking hours

Broader developments in the economy as well as society have meant that a range of services are increasingly available outside traditional business hours. In the conclusions to the Strategic Review, the PSB noted the desirability of the retail payments system being able to support transactions outside normal banking hours (RBA 2012).

For some fast retail payment systems overseas, transactions can be initiated and funds received 24 hours a day, 7 days a week. These 24/7 operations include Denmark's RealTime24/7, India's IMPS, Korea's EBS, Singapore's FAST, South Africa's RTC, Sweden's BiR and the United Kingdom's FPS. Other fast retail payment systems such as Mexico's SPEI, Brazil's SITRAF and Japan's Zengin System are limited to business days (Table 3). Mexico's SPEI

Table 2: Settlement

Country – System	Interbank settlement model
Brazil – SITRAF	Deferred net (every five minutes)
Denmark – RealTime24/7	Deferred net (six cycles a day)
India – IMPS	Deferred net (three cycles a day)
Japan – Zengin System	Hybrid; deferred net; real time for payments above ¥100 million
Mexico – SPEI	Real-time
Singapore – FAST	Deferred net (two cycles a day)
South Africa – RTC	Deferred net (approximately hourly cycles)
South Korea – EBS	Deferred net (one cycle on the next day)
Sweden – BiR	Real-time
Switzerland – SIC	Real-time
United Kingdom – FPS	Deferred net (three cycles a day)

Sources: National Sources; RBA

will progressively expand operating hours for fast payments via mobile devices over 2015, moving towards 24/7. The Bank of Japan recently announced that it would investigate whether the Zengin System should transition to 24 hour operations, identifying that this could improve the efficiency of managing funds and enable beneficiaries to use funds in real time (Bank of Japan 2014).

Table 3: Examples of System Availability

Country – System	Operating hours
Brazil – SITRAF	07:30–17:00[a]
Demark – RealTime24/7	24/7
India – IMPS	24/7
Japan – Zengin System	08:30–16:40[a]
Mexico – SPEI	06:00–17:30[a]
Singapore – FAST	24/7
South Africa – RTC	24/7
South Korea – EBS	24/7
Sweden – BiR	24/7
Switzerland – SIC	$16:40_{s-1}$–$16:15_s$[b]
United Kingdom – FPS	24/7

(a) Business days
(b) The settlement day starts on the day prior to the value date and continues through to the afternoon of the value date; customer payments after 15:00 in SIC are settled as next-day payments (Mägerle and Oleschak 2009)
Sources: National Sources; RBA

'Addressing' solutions

In order for a payment to be made by the payer directly into a recipient's account, the receiving financial institution needs sufficient information about that account. Traditionally, the recipient would be obliged to provide the payer with account details – usually a code to identify the financial institution and another to identify the account. In Australia, this typically means a six digit BSB number and a nine digit account number. Very often, these details are difficult to remember and can easily be keyed in incorrectly. 'Addressing' solutions, which allow a payment to be sent to an account linked to a phone number, email address or other identifier, offer a

means for tackling these difficulties and will be a feature of Australia's NPP.

Internationally, India's IMPS allows mobile phone numbers to be used as addresses for payments. IMPS uses a seven digit Mobile Money Identifier (MMID) to link a customer's bank account number to their mobile phone number. Payers can use a payee's MMID and mobile number to make payments through a mobile application, via SMS or at an ATM. In the United Kingdom earlier this year, the Payments Council, along with participating banks and building societies, released Paym, a service that enables mobile phone numbers to be used as payment addresses for person-to-person payments.

Richer remittance information

The ability to attach explanatory (remittance) information to a payment is very important to businesses and, to a lesser degree, consumers. In a number of countries, including Australia, the electronic payment systems used by businesses have provided only very limited capacity to carry additional information – typically 16 to 20 characters. This is one reason why cheques have been used rather than electronic payments in some circumstances, as additional information can be provided by writing on the back of the cheque, by attaching written information with a paper clip, or via a perforated form. The newer retail payment systems, including the NPP, are being built with the capacity to carry a significant amount of additional information. As well as the increased amount of data that can be attached to a payment, the ability to use an agreed structure to the data provides scope for improvements in business efficiency, from facilitating straight-through processing, to making reconciliation of payments and receipts easier and more accurate. For example, Japan's Zengin System, originally constrained to 20 characters of information per payment message, has been expanded to provide the option of 140 characters (Bank of Japan 2014). In Australia's case, there will be a significant expansion from the 18 characters currently available using the Direct Entry system.

Changes to the capacity to carry remittance information in many cases are closely associated with the standards adopted for the format of payment messages. Historically, many jurisdictions have relied on unique domestic messaging standards for payment systems. However, as modern payment systems are increasingly being integrated with other systems, both domestically and internationally, there is an increasing need for payment messaging to be interoperable. A relatively new standard, ISO 20022,[6] is becoming accepted as 'an enabler of a single, common "language" for global financial communications' (The Federal Reserve Banks 2014b). Many existing fast payment systems will adopt, or are considering adopting, ISO 20022 standard messaging, while most new systems are developed to be compliant with these standards. For example, in Europe, ISO 20022 standard messaging is a requirement for processing interjurisdictional Single European Payments Area payments (European Payments Council 2014). Denmark's RealTime24/7, Sweden's BiR and Singapore's FAST systems were developed to include ISO 20022 messaging standards, while Switzerland has committed to upgrade SIC to incorporate ISO 20022. The United Kingdom's FPS currently operates using an alternative standard, ISO 8583. The NPP will adopt ISO 20022 messaging.[7]

Services provided

Fast retail payment systems have tended to target person-to-person payments, where speed is valued, and business-to-business payments, where both speed and improved remittance information are valued (The Federal Reserve Banks 2014a). They could potentially also target person-to-business payments. This is the case with the Zapp service, to be offered in 2015 through the FPS system in the United Kingdom.

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6   ISO, the International Organization for Standardization, develops and publishes international standards. ISO 20022 is a standard set by the ISO technical committee responsible for standardisation in the field of banking, securities and other financial services.

7   The ISO 20022 message format will form part of the core functionality of the NPP's basic infrastructure (see APCA (2013) and SWIFT (2014)).

The access channels provided vary depending on the country setting. In many countries, users access fast payment functionality via internet services provided by their bank. This is readily extended to smartphones. However, in India the opposite progression occurred. IMPS started as a bank-led mobile phone payment service. It was available on most mobile phones (i.e. not restricted to smartphones) and was considered a potential platform to increase accessibility to banking products, given the large proportion of India's population that does not have a bank account. The robust adoption of IMPS mobile payments has seen its product offerings evolve to include both internet and ATM real-time interbank fund transfers.

The use of mobile phones as an access channel for fast payment services is a focus for a number of fast payment systems, including in the United Kingdom, Sweden and Singapore. This dovetails particularly well with some services for easier addressing of payments. For instance, the Paym service recently introduced in the United Kingdom enables mobile phone numbers to be used as payment addresses for person-to-person payments (Payments Council 2014). Users register their mobile phone number and link it to their bank account number. They can then send and receive real-time payments to other registered users using their mobile phone numbers through their bank's internet portal.

The Design of the New Payments Platform

The broad approach to providing infrastructure that would support fast retail payments in Australia was established by the industry Real-Time Payments Committee (RTPC) and published in February 2013 (APCA 2013). The RTPC proposed the establishment of a mutual collaborative clearing utility to provide the payments infrastructure to which authorised deposit-taking institutions would be connected for real-time clearing of payments. This utility, known as the Basic Infrastructure (BI), will not be commercial in nature and will provide a platform through which a variety of payment services can be offered. While

financial institutions will be able to offer basic payment services to their customers using only the BI, the model proposed by the RTPC anticipates that a variety of 'overlay services' will be able to use the BI to offer commercially oriented services, for instance through a commercial scheme. Participation by financial institutions in any particular commercial overlay would be voluntary. This model was chosen with the view that it would provide the greatest scope for innovation and competition between financial institutions and payment providers in the services that can be offered to end users.

The RTPC also proposed that an agreed overlay service, referred to as the 'Initial Convenience Service' (ICS), would be built at the same time as the BI, to help establish a compelling proposition for use of the NPP from the outset. While the ICS will be the first overlay to give payments system users access to fast retail payments, it is intended to be the first of a number of overlay services that could be developed over time.
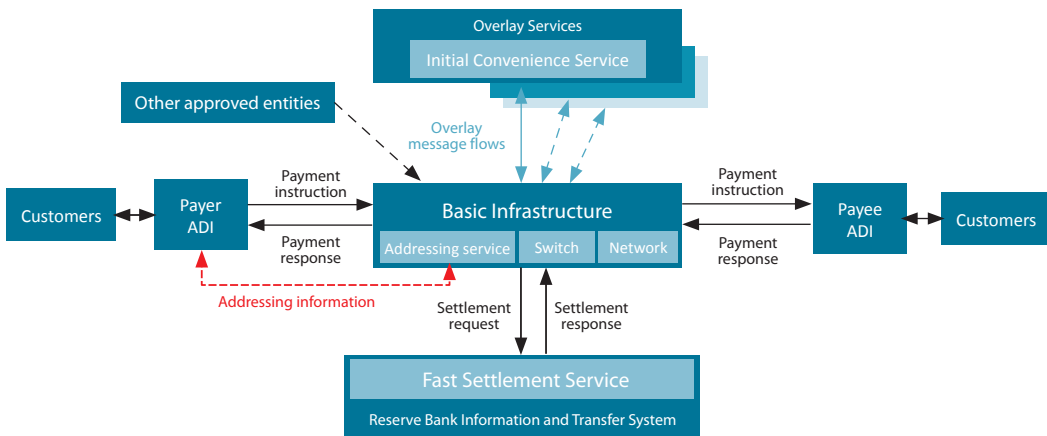
The BI and the ICS comprise two of the three main components of the NPP. In addition, the Reserve Bank is developing a Fast Settlement Service (FSS)

that will provide line-by-line real-time settlement of transactions processed through the NPP. This model will enable real-time clearing and settlement for retail payments, with the recipient's financial institution able to provide fast access to funds without incurring interbank settlement risk. The interaction of these three components – BI, ICS and FSS – is illustrated below (Figure 1).

Consistent with the approach taken in recently developed fast retail payment systems, the NPP will operate 24 hours a day, 7 days a week and will incorporate ISO 20022 messaging standards to facilitate the inclusion of richer remittance information with transactions. The NPP model also includes an addressing solution, enabling users to receive payments without having to supply BSB and account numbers to the payer.

This combination – of real-time capability, 24/7 operations, richer messaging functionality and easier addressing – addresses the key gaps in the payments system identified by the Strategic Review. The capacity for new overlay services to utilise the system should also be a vehicle for innovation and competition.

Figure 1: The New Payments Platform

Sources: APCA; RBA

Concluding Comments

The NPP will represent an important piece of national infrastructure for Australia. While its development is a significant undertaking for the payments industry, the services it will provide are consistent with the changing needs and expectations of payments system users and with developments overseas, where interest in such systems is becoming more widespread. The Australian industry is seeking to learn from the experiences overseas; at the same time, the Australian approach to implementing fast retail payments is also being observed closely in other jurisdictions considering taking similar steps in the future.

The Reserve Bank will continue to work with the industry over the coming years to turn the NPP vision into reality. ⚬

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