



# Mobile Payments turn phones into virtual EFTPOS machines

Vodafone New Zealand's HotLink is a virtual eftpos solution based on the concept of treating mobile phones as a payment channel. Banks can facilitate mobile phone payments with little need to change their back office systems. Mobile payments integrate into the existing payment infrastructure, and are compliant with existing standards.

New Zealand has a highly banked population. Wages, salaries and social welfare payments are paid almost without exception into a bank account. This requires all segments of society to have a banking relationship. Banks have also rationalised their branch networks and discouraged the use of paper-based payment instruments, leaving their customers with no option but to use a debit card to access their funds.

## ATM cards grow up

The debit card's origin goes back to the ATM card, issued by banks in the early to mid 80's. These cards are generally personalised, only accepted in a 'card present' situation and are often supported either with the Visa Plus or MasterCard Cirrus branding for international acceptance. PIN is the only form of authentication.

“BANKS CAN FACILITATE MOBILE PHONE PAYMENTS WITH LITTLE NEED TO CHANGE THEIR BACK OFFICE SYSTEMS.”

“NO NEW ZEALAND RETAILER CAN EXPECT TO OPERATE WITHOUT AN EFTPOS DEVICE.”

As the country developed an electronic point of sale network, New Zealand banks decided to extend acceptance of the ATM card rather than issue a second card. The point of sale devices were deployed with PIN pads to support the security requirements of accepting a PIN, rather than a signature, for cardholder authentication. The ATM card became the bank-issued proprietary debit card.

The point of sale network became known as eftpos, (electronic funds transfer at the point of sale). It's a highly secured network for retail payments, supporting the concept of non-repudiation. Approved transactions guarantee the retailer payment.

A similar system has been deployed in other countries such as Australia and Singapore.

## No business without eftpos

In New Zealand from the late 1980's, EFTPOS became all-invasive. No retailer can expect to operate without an eftpos device. Customers will use their debit card to pay for a \$3 cup of coffee. This has meant cash carried by New Zealanders is low and reported to be lowest in the OCED.

The eftpos network will also accept credit cards. Although traditionally these have been signature-based there has been a recent shift to PIN-based credit card authentication. Selective banks also rationalised the plastic they issue by moving to a one-card strategy. This card is both a debit and credit card. Cardholders are requested to select an account at the point of sale, (current, savings and credit). The choice of account determines the transaction type.

Debit or eftpos transactions, (non credit) are processed using the single message protocol. The funds are debited from the account at time of authorisation and no clearing transaction is processed at the individual cardholder level at the end of day. Merchant settlement occurs at end of day.

Credit card transactions accepted by eftpos generally continue to be processed using the dual message protocol of an authorisation followed by a clearing transaction at the end of day.

## Two types, one model

For both card types the four party model of merchant, acquiring institution, issuing institution and cardholder is supported.

The following table shows the number of EFTPOS devices per one million people. What is clear is New Zealand tops the league and has done so since the early 1990's. The market is showing signs of maturity with Australia closing the gap. Most other countries are well behind.

	1995	1999	2003
New Zealand	11,765	20,423	25,274
Australia	4,684	13,998	22,838
Belgium	7,174	9,746	10,900
Canada	6,448	13,317	16,416
France	9,394	13,261	16,267
Germany	856	5,761	6,008
Italy	2,683	7,549	15,945
Netherlands	4,736	9,208	11,466
Singapore		4,506	6,679
Sweden	6,160	9,160	12,062
Switzerland	3,499	8,599	10,803
UK	8,647	11,970	14,508
US	2,010	8,414	13,365

Source: New Zealand Bankers Association & Bank of International Settlement as published by the Australian Payments Clearing Association.

“WITH A MOBILE PAYMENT, THE CARDHOLDER IS PRESENT BUT THE CARD ITSELF IS NOT PRESENT. CONVENTIONAL WISDOM ASSUMES BOTH ARE ALWAYS TOGETHER.”

“THE MOBILE PAYMENT DELIVERY CHANNEL INTEGRATES WITH THE EFTPOS CHANNEL AT A CENTRALISED COMMERCIAL SWITCH.”

The following table provides a profile of debit and credit card usage in New Zealand with a comparison to Australia for context.

Card Per Head of Population		
Card Type	New Zealand	Australia
Debit	1.14	1.23
Credit	0.50	0.54

Debit Cards Per EFTPOS Device		
Card Type	New Zealand	Australia
Debit	39.79	54.20

Transaction Per Card Per Month (Av)		
Card Type	New Zealand	Australia
Debit	9.11	3.65
Credit	6.37	8.54

Source: New Zealand Bankers Association & Australian Reserve Bank

This table shows a high dependency on Debit and eftpos in New Zealand over Australia. Credit in Australia has a higher level of acceptance.

## Mobile Payments – HotLink

When defining the mobile payment system to support HotLink the nature of the New Zealand payments environment was a major influencing factor.

1. All New Zealanders from an early age have a bank account. This meant the introduction of a mobile wallet to support non-micro-payments was unlikely to gain subscriber support. Direct access to the existing bank accounts addresses the source of funds issue.
2. The development of a separate set of processes, regulations and messaging protocols to support mobile required a substantial commitment from the banking industry. A commitment unlikely to be met by the banking industry because of cost and resource constraints.
3. Subscribers were familiar with eftpos and ATMs so why not make mobile a third 'like' network with a consistent user interface and processing standard.

## Leapfrogging conventional wisdom

Mobile payments presented a unique challenge. With a mobile payment, the cardholder is present but the card itself is not present. Conventional wisdom assumes both are always together. The phone handset in effect is a substitute or a link to a virtual image of the card.

The decision was made to capture card details used in an eftpos transaction at the time of registration. For a magnetic strip card, this detail is known as "Track 2". Track 2 is stored securely in the banks' environment and cross-referenced to the mobile handset. (MSISDN).

Subscribers initiate a payment from their handset and enter their debit card PIN number. The PIN is encrypted and passed through to the issuer for authentication. The message received by the bank is commonly referred to as an ISO8583, 0200 financial message. The Track 2 detail is inserted in this message as if the card was used at an eftpos device. The subscriber's bank receives a message as if it originated from an eftpos device in a card-present situation.

## About Peter

Peter Goldfinch, GFG Group's General Manager South East Asia, is a respected analyst and commentator on global trends in payment technology.

One of the original founders and shareholders in GFG Group, Peter has a background of more than 23 years in the information technology industry, most of which has been involved with consulting and systems development for banking and finance customers in 25 countries.

He has particular expertise and experience in payment systems, including mobile payment systems. His career highlights include pioneering work on the first ATM and EFTPOS networks.

In the mid-1990s, he played a key role in the introduction of credit and debit cards into the Russian market, working with GFG's customer SBRF.

## About GFG

GFG Group is a highly-specialised payment solutions company, providing its clients with products, advice, and systems integration and outsourcing services. Accredited by the World Bank, the company has established a global presence over the last decade - delivering leadership payment solutions to more than 50 customers in over 40 countries.

A key element in GFG Group's success is its focus on development and investment in five high-demand payment solution areas:

- Card Management Systems
- Mobile Payment Solutions
- Customer and Merchant Loyalty Systems
- Managed Services
- Payment Tools

The company's core research and development team is based in Auckland with consultants and technical staff located in the international offices to provide front line 24 x 7 support for customers in multiple geographies.

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## High-level technical overview

The key point of the below diagram is to illustrate how the mobile payment delivery channel integrates with the eftpos channel at a centralised commercial switch. The centralised switch is owned by a consortium of banks. In any other implementation the Payment Service (responsible for building the ISO8583 0200 messages) can connect directly to an individual bank switch.

