



INTERCOMPUTER™

A 21ST CENTURY SOLUTION FOR A UBIQUITOUS ELECTRONIC PAYMENT SYSTEM

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Introduction

In this document, we will describe a *patented* software solution that *already exists* to deliver, with *underwritten security*, the ubiquitous, cost-effective real-time payments infrastructure described by the Federal Reserve. Given the solution's current state of readiness, we think it is entirely realistic to expect that the nation's banks could achieve adoption by 25% of their customers within three years.

We will address each of the Fed's desired outcomes with specific features and applications (*noted in blue*) of InterComputer's eCash™ solution, which serves the LBE, SBE, consumer and POS markets equally well. InterComputer's eCash solution is the bank-neutral platform which, when adopted and installed on dedicated servers and mapped to backend systems, will allow banks to provision their customers with near real-time transactions under a comprehensive insurance umbrella. This unique transaction insurance covers all the parties to a transaction with loss damage recovery for the face value, lost business and third party liability. To our knowledge, no other electronic payment solution can make this claim.

Desired Outcomes

The Federal Reserve Banks have identified five desired outcomes to be achieved within ten years to address the gaps and opportunities identified above. The outcomes reflect the Federal Reserve Banks' internal analysis and input from a variety of industry stakeholders.

Desired Outcome 1: Key improvements for the future state of the payment system have been *collectively* identified and embraced by payment participants, and material progress has been made in implementing them.

The ubiquitous electronic solution The Fed desires is not a concept in development. It already exists, has moved money between two U.S. Banks in as few as 15 seconds per non-repudiable

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transaction, and is patented in the United States. It requires no special hardware and employs a standard Internet connection from any personal computer or smartphone.

Creating such a solution is impossible by combining chunks of technology from different vendors; it is simply impossible to underwrite the security of any such “solution”. It is also impossible to create the required solution using technology that was spawned decades ago.

The details of the required approach to inventing a 21st century, near real-time, fully insured, information rich, ubiquitously adoptable electronic payments solution are contained in over 500 pages of patent application documents. The broad strokes are available to the world at <http://www.InterComputer.com> .

The core technical, legal, security, and insurance principles are:

- The core messaging software must be “closed”, meaning that the ability to change it must be controlled by a single, neutral entity.
- The core messaging software must be easily and inexpensively accessible by banks, organizations and individuals.
- Trusted InterOperability must be available to payers in the end-to-end purchase-to-payment cycle.
- The core messaging transfer software must InterOperate with existing legacy systems such as customer account systems at banks, ERP systems and treasury management systems at LBEs, small business accounting systems at SBEs, and POS systems at retailers.
- Risk evaluated methodology must be used throughout the software architecture, design, and coding.
- Multiple layers of protection are required for both encryption and security sub-systems
- The solution must give banks and other organizations the ability to create and administer digital certificates (enhanced x.509 v3) for their customers that establish not only identity, but also transaction authority and an auditable “chain of command”.
- All parties to the transaction must be able to immediately validate the digital identity and authority certificates.
- After multiple layers of protection provide adequate shielding to data the residual risk must be transferred to insurance companies who underwrite “Transaction Insurance”, which includes loss damage recovery due to any system failure, hacking, malicious code insertion, or other forms of Internet crime. Transaction insurance includes the face value of the money being transferred.

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- The system must sufficiently prevent and deter “insiders” from committing cybercrimes or other fraudulent actions to the degree that the underwritten Transaction Insurance can include coverage for the technical side of any insider threat.
- The solution must support a banking agreement mechanism that creates legal finality and non-repudiation of payments between banks and their customer. Reg E compliant safeguards must be in place between any bank and its customers.

The core commercial and payment principles are:

- The payment software application must enable bank customers to send or receive funds in near real-time (15 seconds).
 - Money must move immediately from a bank customer’s demand deposit account at the sending bank to the recipient’s demand deposit account at the receiving bank.
- Payments must be legally binding when completed to provide unquestionable funds availability.
- Multiple levels of reconciliation must occur at each point in the money movement.
- Real-time final electronic acknowledgement between sender and receiver must be available.
- Remittance data must travel with the payment message.
- Remittance data should be automatically postable to business customers A/R systems.
- System must be capable of managing Point-of-Sale payment transactions.
- Banks must be able to add the core messaging software and real-time payment software to their existing IT environments on dedicated servers for a smooth migration from legacy payment systems to 21st century technology.
- The software must be fully scalable, limited only by hardware resources.

Benefits:

Control, Cost, Convenience, Cash Management, Compliance, Revenue

Desired Outcome 2: A ubiquitous electronic solution(s) for making retail payments exists that does not require the sender to know the bank account number of the recipient. Confirmation of good funds will be made at the initiation of the payment. The sender and receiver will

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receive timely notification that the payment has been made. Funds will be debited from the payer and made available in near real time to the payee.

'Good funds' means that the payer's account is valid, funds or available credit are sufficient to cover the payment, and therefore, the payment will not be reversed for lack of funds.

POS

- Banks must authorize and provision retailers to perform eCash™ trusted settlement transactions.
- The combination of ubiquitous smartphone technology and InterComputer's patented AuthoriTree™ digital identities (using enhanced x.509 v3 digital certificates) is quite capable of protecting and managing bank account information or any other unique identifier(s) banks and retailers may require. This will allow for the correct routing of payments without the payer knowing the payee's account number.
- During customer enrollment, the banks will generate required digital certificates using the IC Control Bridge. These certificates are fully usable for other bank products.
- Our eCash solution is mapped to the Retailer's POS system with support interfaces as needed.
 - Three methods for retailer to present the total of the sale:
 - NFC functionality installed at POS machines. (For NFC enabled smartphones.) NFC is the preferred method.
 - Driver's License or DMV issued identity card readers installed at POS can identify the individual at the bank. Sale amount is transmitted back to the Bank app on the smartphone.
 - If no DL reader is installed, a special applet written by IC and included in the mapping function can enable a clerk to enter a driver's license number and name directly.
- If the funds or available credit required to make the purchase are not in the purchaser's account, the sale will be declined. (With smart phone apps, purchasers can be aware of their available balance or credit by using their bank app.)

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- A prompt will be sent to the customer's bank app on their mobile device to ask for the approval to authorize the payment.
- A second prompt will display Reg E related language and a legal notice that the purchaser understands the transaction is final when completed. The user's password will constitute legal acceptance and proof of presence.
- Upon confirmation of the legally final prompt, the funds will be transferred from the purchaser's bank to the retailer's bank within a few seconds.
- A second function of IC's mapping to the retailers POS (either through API or an IC supplied applet) is that the sales receipt can be electronically sent to the purchaser's bank app on their mobile device.

Velocity of Funds

eCash™ Trusted Settlement transactions will produce a measurable increase in the velocity of funds. This results in an increase in greater transaction volume and higher account balances. Altogether, as the Fed has noted, a near-real time payment system should increase productivity and provide substantial stimulus to the national and global economies.

Desired Outcome 3: Over the long run, greater electrification and process improvements have reduced the average end-to-end (societal) costs of payment transactions and resulted in innovative payment services that deliver improved value to consumers, businesses, and governments.

Pre-Purchase Activity

The insured core technology of eCash Trusted Settlement solutions has no natural market boundaries; it is not just for banks. InterComputer solutions can provide the same insured security and Trusted InterOperability between business partners engaged in the exchange of high-value information, as well as funds. When mapped to existing ERP, treasury management and/or SBE accounting systems, they provide complete privacy and security during purchasing, contracting fulfillment, invoicing—and of course real-time money and automatic posting of residual entries via their respective banks. These features have already reduced cycle times and overhead costs by as much as 90% in commercial applications in the insurance industry.

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Further, the IC IOS provides “full duplex” document-to-document chat. This means that two or more authorized employees engaged in a business transaction can simultaneously view a document such as contract, purchase order, or sales order while chatting with each other in real-time. This efficiency accelerates problem solving and prevents time-consuming errors. All of this efficient activity occurs under InterComputer’s unique Transaction Insurance coverage umbrella.

Economic Benefits

In the year 2000, several highly respected firms made public projections for the growth of eCommerce in the coming decade. To date, the U.S. economy has achieved less than 15% of that projected eCommerce growth.

As 21st century electronic processes replace antiquated solutions and enable secure, private and direct eCommerce without browser risk, those rosy projections of eCommerce growth will finally be realized.

Altogether, economic activity will increase as this new technology brings down the cost of doing business and fuels innovators by making new businesses more competitive more quickly.

Desired Outcome 4: Consumers and businesses have better choice in making convenient, cost-effective, and timely cross-border payments from and to the United States.

End-user demand for cross-border payments has increased due to globalization of trade and labor. Today, both personal and business cross-border payments typically involve much higher transaction fees and longer processing times than domestic payments. As globalization accelerates, the need for fast and efficient cross-border payment solutions will continue to increase.

Real-time Cross Border Payments

There is no known technological obstacle to the adoption of an eCash Trusted Settlement Payment solution by a bank in a country other than the U.S. The Transaction Insurance offered by InterComputer with its solutions is valid around the globe. The near real-time performance of such solutions, including settlement and clearing, is essentially unaffected by their geographic location. Placing a forex mechanism between two international banks can produce insured-secure, reliable payments based on up-to-the-second FX rates.

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Desired Outcome 5: The Federal Reserve Banks have collaborated, as appropriate, with the industry to promote the security of the payment system from end-to-end amid a rapidly evolving technology and threat environment. In addition, public confidence in the security of Federal Reserve financial services has remained high.

The Federal Reserve Banks are essential to reach the goal of near real-time payments for three reasons:

- **Private sector banks are driven by quarterly results.** Their interest and commitment to their bottom line is absolute. As in any other industry, that shorter term focus often precludes the visionary thinking and action necessary to achieve any industry-wide fundamental breakthroughs. That is why the fundamental banking technologies in current use have not radically changed in decades.
- **Private sector banks move together, and slowly, because no bank wants any other bank to develop a significant competitive advantage.** This is why decades of “co-opetition” in the development of banking technologies have failed to produce a substantial agreement on any new standards. This is also why the big private sector banks will never allow one of their number to act as the “neutral” administrator of a ubiquitous, near real-time payment system.
- **A mandate from a neutral party, such as the Fed, will allow all bank managers to avoid taking flak for the transition costs and any temporary glitches in the adoption process.**

Conclusion

Part way between Los Angeles and San Francisco on Interstate 5 in the heart of California’s agricultural San Joaquin Valley, a sign says, “Food Grows Where Water Flows.” Of course the sign is intended to remind travelers that water is an essential resource for increasing agricultural productivity. The great California Aqueduct, visionary in the 1950’s, is still the vital means of moving water from northern California throughout the 400 mile long valley. A remarkable engineering achievement, it is more valuable today than when it was constructed, enabling additional acreage to be cultivated each year.

Human economic activity is like cultivated land, but is fueled by money. The monetary corollary to the sign mentioned above is, “Productivity Grows Where Money Flows.” The call of the Federal Reserve System to encourage near-real time money movement will benefit banks, their

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customers and the economy as whole. Real-time money does not necessarily mean that organizations and individuals will pay their bills any sooner than terms require, but it does mean that capability exists when required. It also means squeezing the fat out of the process, thus significantly lowering bank operating costs. It means providing customers with ease and certainty in sending and receiving funds. Such a system is sorely needed in the 21st century, not only for our national economy but for our global competitiveness.

Just as the California aqueduct continues to add value to California's economy, a real-time payments solution built to last on correct foundation principles will bring lower costs and new revenue opportunities to banks, increased confidence and safety to consumers, new levels of efficiency and opportunity to businesses, and increased national economic activity and global competitiveness.

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