Introduction

The world’s payments systems were built before the Internet was invented, so they are inherently not built for the web. Rather, they were built country by country and they weren’t designed with interoperability in mind.

As a result, payments, especially cross-border, are slow and expensive. A wire transfer in the U.S. typically takes three business days with an operating cost of $15 or more. Moving money between systems is even more painful. The Internet wires together the world of information, but the same is not true for payments.

Ripple is an open source protocol for financial transactions. It allows independent payment systems and individual users to communicate as easily as email systems do - in every currency, language, and country. The Ripple network provides a global exchange protocol that can securely and instantly connect the myriad of technologies and companies that are working to take payments onto the web.

This paper highlights some of the ways that Ripple’s federated settlement system and distributed identity solution fit into the vision of the W3C Web Payments workshop. We hope to engage with the participants in order to integrate Ripple with the many other payment, identity, and security technologies and standards represented at the workshop.

Ripple: Distributed Clearing and Settlement

Most financial networks today require explicit settlement agreements in order for their participants to transact with parties in other networks. Parties who wish to settle have to agree on a centralized clearinghouse. As long as the settlement process is controlled by centralized clearinghouses, there will never be universal agreement on a single one. This results in needlessly high transaction costs, poor user experiences, reduced liquidity, and barriers to economic growth.

Ripple technology allows independent payment systems to communicate as easily as email systems do. All of the software is open source, no one owns Ripple, and there is no central operator. If Ripple’s settlement process becomes part of the W3C’s Web Payments protocol, payments will be truly effortless. Users will never have to worry about whether they share a payment processor and transactions will be processed instantaneously and with practically no fees.
The Ripple network, at its core, is a shared, public database. Within the database is a ledger that tracks accounts and balances. Computers on the network mutually agree on changes to the ledger through a process called consensus. The network reaches consensus globally within seconds. This consensus finding process is the engineering breakthrough that allows for fast, secure, and decentralized transaction settlement on the Ripple network.

Ripple supports any currency. You can hold balances in one currency and send payments in another. You can hold your balances on Ripple in USD and pay a merchant in JPY, EUR, bitcoin, gold, or any other asset. The Ripple network "translates" currencies by routing orders through market makers who compete to capture the bid/ask spread.

Ripple’s distributed exchange allows users to trade without the need for a broker or a third party exchange. Anyone can post bids or offers into aggregated global order books, and the Ripple network finds the most efficient path to match trades. Network fees are currently on the order of ten millionths of one XRP, or around 5 million transactions for $0.01 USD, and there is no minimum transaction size.

Ripple is the world’s first universal translator for money.

At the W3C Web Payments workshop, we hope to explore how distributed clearing and settlement can integrate remittances, cryptocurrencies, digital wallets, mobile money, peer-to-peer transactions, crowdfunding, and more. Above all, we want to make this technology work for average people the world over. We know that technology is only as good as the effect it has on people’s lives, which is why we strongly support the development of web and digital payment standards.

**Distributed Identity on the Ripple Network**

Currently there is no open, standardized personal identity system capable of securely verifying financial transactions. Most digital identity systems are centralized, such as Twitter or Google. They offer a user-friendly experience but are non-neutral and thus cannot serve as a secure, universal identity provider. Users can choose to tie everything to one provider or are forced to create individual accounts for every website they use. Identities are hard to verify and fraud is rampant.

Ripple’s distributed network is a neutral database that can be used to securely store people’s identities. As payments go online and the number of processors grows, the need for a common identity system to certify transactions and protect users from fraud will only increase.

We firmly believe that web-based identity systems must be underpinned by asymmetric encryption schemes, such as those used by Mozilla Persona. Credit card fraud and identity theft
are widespread problems because these systems use shared secrets, which means that each transaction a user completes risks exposing their personal data and money. Asymmetric encryption, coupled with emerging hardware security solutions, facilitates exchanges without forcing users to broadcast their personal details over the web.

What Ripple uniquely brings to the web payments world is the combination of asymmetric encryption and a distributed system. We want to support the work of others in this area but we would like to see a move away from identity providers. A flat, global namespace -- one like Twitter -- provides the best user experience and, if implemented in a neutral way, can provide the basis for the future of web payments.

We are currently building an identity system on top of Ripple’s distributed ledger that stores KYC information, provides space for third party attestations, and can manage any number of financial or other accounts.

Identity is one topic where collaboration amongst all of the different web payment actors is absolutely essential and we are excited to work with, share, and learn from the other workshop participants. Standardization and a common means of expressing identity will help everyone transact with ease and take full advantage of the new technologies coming online now and in the future.

Conclusion

The world of payments is at an important and exciting juncture, where internet technologies and advances in security are finally making it possible to take financial transactions and personal identities online. These developments offer the potential to reduce unnecessary barriers to commerce, facilitate new exchanges and business models, and spur economic growth around the world. As the chief web standards body, the W3C plays an instrumental role in promoting collaboration and outlining how all of the various payment technologies can work together.

We believe that Ripple’s technology can further these goals by providing an open source, distributed protocol for financial settlement and personal identity. We are excited to share and work with the other Web Payments workshop participants to start laying the groundwork for a digital world that is accessible and beneficial to all.