

December 5, 2021



Future of Money
Money and Cash Department
Reserve Bank of New Zealand
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Wellington 6140
New Zealand

Email: futureofmoney@rbnz.govt.nz

Dear Sir or Madam,

Ripple Labs Inc. ("Ripple") welcomes the opportunity to comment on the Future of Money – Central Bank Digital Currency ("CBDC") Issues Paper ("CBDC Issues Paper") published by the Reserve Bank of New Zealand ("RBNZ") on September 30, 2021.¹

Ripple would like to thank the RBNZ for the in-depth and comprehensive analysis that has been undertaken in the CBDC Issues Paper, and in the related RBNZ Future of Money issues papers - the Stewardship Issues Paper ("Stewardship Issues Paper") published on September 30, 2021,² and Cash System Redesign Issues Paper ("Cash Issues Paper") published on November 30, 2021.³ Ripple has responded separately to the Stewardship Issues Paper on December 5, 2021, and also intends to respond to the Cash Issues Paper by the deadline of March 7, 2022.

Introduction

Ripple's software products enable financial institutions to send money globally, on a real-time basis, at a fraction of the cost of traditional services available to market participants. Using blockchain technology, Ripple allows financial institutions to process payments instantly, reliably, cost-effectively, and with end-to-end visibility anywhere in the world.

¹ See <https://www.rbnz.govt.nz/notes-and-coins/future-of-money/cbdc>, Reserve Bank of New Zealand the Future of Money – Central Bank Digital Currency Issues Paper.

² See <https://www.rbnz.govt.nz/notes-and-coins/future-of-money/stewardship>, Reserve Bank of New Zealand the Future of Money – Stewardship Issues Paper.

³ See <https://www.rbnz.govt.nz/notes-and-coins/future-of-money/cash-system>, Reserve Bank of New Zealand the Future of Money – Cash System.

Ripple's aim is not to replace fiat currencies, but rather to enable a faster, less expensive, and more transparent method of making cross-border payments that is in the public's best interest. Ripple's customers and partners are regulated financial institutions - banks and payment service providers - who operate within the contours of the existing financial system.

Interoperability

While the CBDC Issues Paper focuses on developing a policy case for a general-purpose CBDC to be used domestically, the RBNZ also recognizes that a CBDC will also enable New Zealand to take part in global initiatives that use CBDCs to improve cross-border payments.⁴ Ripple believes that interoperability - achieved through alignment of national payment protocols and adoption of international standard protocols - will ultimately be core to any successful CBDC design.

Ripple itself applies protocols to drive the efficient globalization of value through multiple initiatives with financial services and open-source communities. RippleNet, our enterprise software solution which is powered by a standardized application programming interface ("API") and built on the market-leading and open standard Interledger Protocol, enables financial institutions to facilitate faster and less costly cross-border payments. RippleNet demonstrates that deep interoperability between commercial financial institutions can make payments truly efficient, particularly in eliminating the uncertainty and risk historically involved in moving money across borders using interbank messaging alone.

In addition, Ripple offers these entities an On-Demand Liquidity capability which leverages the digital asset XRP as a bridge between fiat currencies, further reducing the friction and costs for commercial financial institutions to transact across multiple global markets. XRP is the digital asset that is native to the XRP Ledger, a distributed ledger platform.

Although Ripple utilizes XRP and the XRP Ledger in its product offerings, XRP is independent of Ripple. The XRP Ledger is decentralized, open-source, and based on cryptography. Ripple leverages XRP for use in its product suite because of XRP's suitability for cross-border payments. Key characteristics of XRP include speed, scalability, energy efficiency, and cost.

Protocols used by global, cross-border payment networks and decentralized tools that support them should be considered and supported in this new age of domestic networks, including with respect to the development of CBDCs. Embracing the capabilities of these global networks, and better enabling domestic institutions to connect their individual capabilities with other systems and markets, will result in optimized outcomes for New Zealand's domestic needs as well as fulfill the potential that globalization of value holds.

⁴ See CBDC Issues Paper, Page 25.

Ripple's CBDC Private Ledger

On March 3, 2021, Ripple announced a pilot of a private version of the public, open-source XRP Ledger that provides central banks a secure, controlled and flexible solution for the issuance and management of digital currencies (“the CBDC Private Ledger”).⁵ The CBDC Private Ledger is based on the same blockchain technology that powers the XRP Ledger, which has supported the management of billions of dollars of value for over 8 years, without any significant security or operational issues. This also means that the CBDC Private Ledger is built for payments and designed for issuing currencies. Over 5,400 currencies have been issued on the XRP Ledger over the past 8 years, including XRP which can be leveraged as a neutral bridge asset for frictionless value movement between CBDCs and other currencies.

Therefore, we believe moving money on the CBDC Private Ledger will be cost-effective, reliable and close to instantaneous. Transactions can also happen at volumes required by central banks – the CBDC Private Ledger will handle thousands of transactions per second initially, with the potential to scale over time by using Federated Sidechains⁶ or via the Interledger Protocol.

Transactions on the CBDC Private Ledger are verified by the same consensus protocol used by the XRP Ledger, which is far less expensive and more efficient than public blockchains that leverage proof-of-work. The CBDC Private Ledger is also carbon-neutral and 120,000x more energy-efficient than proof-of-work blockchains,⁷ which can support RBNZ’s commitment to transitioning to a carbon-neutral and carbon-resilient economy while ensuring financial stability.⁸

In addition to leveraging the XRP Ledger technology, the CBDC Private Ledger is also supported by RippleNet technologies and the Interledger suite of protocols, to enable ultra-high throughput use-cases such as micropayments.

The CBDC Private Ledger meets even the highest of security standards for central banks, with each having complete sovereignty and ability to customize based on their own unique privacy and policy requirements. While the CBDC Private Ledger has been designed on the basis of an open-source solution - the XRP Ledger - Ripple has adapted it for use so that central banks such as the RBNZ can run a private network, allowing complete control over the system.

⁵ See <https://ripple.com/lp/cbdc-whitepaper>, Ripple Report: The Future of CBDCs.

⁶ See <https://ripple.com/insights/a-vision-for-federated-sidechains-xrp-ledger/>, A Vision for Federated Sidechains on the XRP Ledger for more information on Federated Sidechains.

⁷ See <https://xrpl.org/assets/pdf/xrpl-sustainability-methodology-2020.pdf>, Measuring the Environmental Impact of Cryptocurrency.

⁸ See https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Statements_of_Intent/soi-2021.pdf?revision=ac11b3ec-53ac-4819-a7b5-192f5bc0c3f9, Reserve Bank of New Zealand Statement of Intent.

With respect to real world applications of the CBDC Private Ledger, on September 22, 2021, Ripple announced a partnership with Bhutan’s central bank, the Royal Monetary Authority of Bhutan, who will use Ripple’s CBDC Private Ledger solution to pilot retail, cross-border, and wholesale payment use cases for a digital Ngultrum.⁹ Ripple also announced a partnership with the Republic of Palau on November 23, 2021, which will initially focus on developing strategies for cross-border payments and a USD-backed digital currency for Palau.¹⁰

With this overview, Ripple respectfully submits the following responses to the questions set forth in the CBDC Issues Paper in the attached Appendix.

Ripple appreciates the opportunity to provide feedback on the CBDC Issues Paper as the RBNZ studies these important issues, and we would encourage and support further dialogue with all stakeholders. Should you wish to discuss any of the points raised in this letter, please do not hesitate to contact [REDACTED]

Sincerely,

Ripple Labs, Inc.

⁹ See <https://www.rma.org.bt/pressrelease/PRESS%20RELEASE%20CBDC.pdf>, Royal Monetary Authority of Bhutan Press Release on Pilot Project on CBDC.

¹⁰ See <https://ripple.com/insights/featured/republic-of-palau-partners-with-ripple-to-develop-digital-currency-strategy/>, Republic of Palau Partners with Ripple to Develop Digital Currency Strategy.

APPENDIX

Ripple respectfully submits the following responses to the questions set forth in section 8 of the CBDC Issues Paper.

Question 1: Do you agree with the motivations for considering a CBDC, as set out in Section 3? Which motivations are more compelling to you (the declining cash use, innovations in private money or the Reserve Bank’s stewardship objective to preserve the fairness and equality afforded by central bank money)? Please rank them in order.

Ripple agrees with the motivations identified by the RBNZ for considering a CBDC, as set out in section 3¹¹ of the CBDC Issues Paper. Ripple feels that all three motivations outlined (i.e., declining cash use, innovations in private money, and RBNZ’s stewardship objective) are equally important.

Question 2: Are there other motivations not discussed in this paper that should be considered?

As has been highlighted by the RBNZ in section 3 of the CBDC Issues Paper, specific motivations for a CBDC differ between jurisdictions.¹²

Research conducted by the Bank for International Settlements (“BIS”) shows that central banks in advanced economies are motivated by financial stability and monetary policy implementation objectives, as well as opportunities for increased payment safety and efficiency for domestic and cross-border payments.¹³

While we support the motivations identified by the RBNZ, Ripple also strongly believes that a CBDC has the potential to bring many unbanked or underbanked people into New Zealand’s financial system for the first time, and financial inclusion should also be a key motivation for the development of a CBDC in New Zealand. While we note that the RBNZ has identified financial inclusion as an opportunity in section 4.2 of the CBDC Issues Paper,¹⁴ we would like to suggest financial inclusion also be considered as a motivating factor.

While the level of financial inclusion in New Zealand is relatively high, with around 99% of adults having access to a bank account according to World Bank data,¹⁵ Ripple believes CBDCs could provide consumers with an easy and secure way to access central bank

¹¹ See CBDC Issues Paper, Page 12.

¹² See CBDC Issues Paper, Page 14.

¹³ See <https://www.bis.org/publ/bppdf/bispap114.pdf>, Bank for International Settlements Paper No. 114 Ready, steady, go? – Results of the third BIS survey on central bank digital currency, Page 7.

¹⁴ See CBDC Issues Paper, Page 21.

¹⁵ See <https://microdata.worldbank.org/index.php/catalog/3307/download/45518>, World Bank Global Findex Database 2017, Page 125.

money and financial services via digital platforms, and without the need for physical access to a bank.

Therefore, CBDCs could be especially beneficial for indigenous communities, who may be located further away from the main population centres and therefore may have less access to conventional payment methods. A CBDC could also help the RBNZ and its partners – the Reserve Bank of Australia and Bank of Canada – meet the financial inclusion objectives identified by the Central Bank Network for Indigenous Inclusion,¹⁶ established in January 2021.

Additionally, we agree with the RBNZ’s assertion that money is a social institution that depends on trust.¹⁷ Ripple thus believes it is important to emphasize the role played by cryptography in helping to enforce the policies that underpin trust as a key motivation for the development of a CBDC in New Zealand. Cryptography could drive efficiency for the RBNZ in monitoring and enforcement of policies, as they can be built into the validation protocol of the CBDC rather than be enforced by individual departments and systems within the RBNZ. Cryptography can also increase overall trust in the financial system, as it reduces the need for intervention in dealing with intermediaries.

Question 3: Do you agree that the scope of work should focus on a general-purpose CBDC in the first instance?

Ripple supports the RBNZ focusing initial research on the viability of a general-purpose CBDC¹⁸ in the first instance. However, we would also like to highlight the importance of a wholesale CBDC in the payments ecosystem, and we are supportive of the RBNZ conducting research on a wholesale CBDC in parallel.

As highlighted by the RBNZ in section 3.2 of the CBDC Issues Paper, wholesale CBDCs are intended for the settlement of interbank transfers and related wholesale transactions.¹⁹ In addition to the benefits for domestic transactions, wholesale CBDCs also bring certain efficiencies for cross-border payments, and offer additional functionality.

One such example is in conditionality of payments, whereby a payment only settles if certain conditions are met. This means that the programmable nature of wholesale CBDCs could encompass a broad variety of conditional payment instructions, going far

¹⁶ See <https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/MoU/MOU-Central-Bank-Network-for-Indigenous-Inclusion.pdf?revision=84a7709a-4d48-4285-be95-092e418ada33&la=en>, Reserve Bank of New Zealand Memorandum of Understanding - Central Bank Network for Indigenous Inclusion.

¹⁷ See CBDC Issues Paper, Page 7.

¹⁸ The terms general-purpose CBDC and retail CBDC are used interchangeably in the marketplace. For the purposes of this comment letter, Ripple adopts the terminology used by the RBNZ in the CBDC Issues Paper.

¹⁹ See CBDC Issues Paper, Page 16.

beyond today's delivery-versus-payment mechanism in real-time gross settlement systems, supporting automation and mitigating risks. Therefore, the same conditionality that is brought to domestic settlements can be extended to cross-border settlements with a wholesale CBDC, providing transparency, reduced risk, and increased stability for cross-border payments.

Ripple welcomes the opportunity to discuss the benefits of a wholesale CBDC in more detail, and to highlight how the CBDC Private Ledger can help the RBNZ in the development of a wholesale CBDC in addition to a general-purpose CBDC.

Question 4: Do you agree with the multi-step process for the development and implementation of a CBDC as outlined in Section 3.1 and illustrated in Figure 8?

Ripple agrees with the multi-step process for the development and implementation of a CBDC outlined in section 3.1 of the CBDC Issues Paper.²⁰

However, as RBNZ moves from Stage 1 to Stage 2 of the process, we would like to highlight the importance of public-private partnerships in the development of a CBDC. We encourage the RBNZ to call on the expertise of private sector firms as it moves to design and testing of a CBDC in stage 2.

Ultimately, we believe that private sector solutions - such as the use of neutral bridge assets like XRP, supported by software solutions like the CBDC Private Ledger - could have an important role to play in supporting healthy liquidity markets that allow for frictionless and cost-effective value movement between new forms of digital money in real time, enabling the exchange of less liquid digital money pairs, and increasing competition by lowering entry barriers to new and smaller market participants.

In addition to partnering with the private sector, we would also like to highlight the importance of partnering with local and regional academic institutions on CBDC education and research. As has been the case with other technologies, academic institutions can unlock the real power of CBDCs through curriculum, research, technical innovation, and knowledge sharing.

Ripple's University Blockchain Research Initiative ("UBRI") supports universities around the world to advance blockchain education and real-world solutions in digital payments and beyond. Partnering with over 35 leading global universities, the UBRI program supports universities on research, new curriculum development, and technical projects. Each participating university shapes its own topics and areas of focus, and Ripple provides students and faculty with strategic guidance, technical resources, and funding where appropriate.²¹

²⁰ See CBDC Issues Paper, Page 16.

²¹ See <https://ubri.ripple.com/faq/>, UBRI FAQs.

Ripple would welcome further engagement with the RBNZ to identify opportunities to build capacity at local academic institutions to develop talent and accelerate research locally.

Ripple strongly believes that an open platform approach, bringing together expertise and investment from different stakeholders including private sector firms, citizen groups, and academia, provides the best opportunity to build value-adding services without friction from intermediaries.

Question 5: Do you agree with the description of the opportunities presented through the implementation of a CBDC?

Ripple appreciates the extensive analysis of the opportunities of a CBDC undertaken by RBNZ in section 4 of the CBDC Issues Paper,²² and we agree with the description of opportunities presented.

Question 6: Are there other opportunities that should be considered?

Ripple would like to note some additional opportunities and policy considerations for the RBNZ to consider in the design of a CBDC.

a. *Micropayments:* We are supportive of the payments efficiency and resilience opportunities identified by RBNZ in section 4.3 of the CBDC Issues Paper.²³ However, a related opportunity that should be considered is in micropayments. We feel that an effective general-purpose CBDC should allow for the processing of micropayments (i.e., payments made for very small amounts). Currently, the transaction costs associated with fiat micropayments are too high to support their execution. It is also important to note that since a general-purpose CBDC is expected to substantially lower these frictional costs, the number of transactions (whether micropayments or not) is likely to be much higher than observed today, leading to greater demand.

b. *Digital wallets:* We are supportive of the financial inclusion opportunities identified by RBNZ in section 4.2 of the CBDC Issues Paper.²⁴ However, it is worth noting here that one of the bigger drivers of financial inclusion over the past decade has been the rise of financial services from outside the banking sector, such as remittance providers and digital wallets. These services are pioneering new offerings and alternative experiences for traditional banking users.

The issuance of a general-purpose CBDC could occur in tandem with the creation of associated digital wallets that give consumers ownership of the digital currency and

²² See CBDC Issues Paper, Page 18.

²³ See CBDC Issues Paper, Page 24.

²⁴ See CBDC Issues Paper, Page 21.

allow for a faster and more efficient method of distribution of money by the RBNZ. Digital wallets that enable payments, whether made domestically or cross-border, without requiring a bank account could succeed in promoting financial inclusion for the unbanked and underbanked population, which may not be adequately served by the traditional banking system, as highlighted in our response to Question 2 of this comment letter.

While digital wallets could be used to enable peer-to-peer, or wallet-to-wallet payments, infrastructure will need to be put in place to allow for the seamless transition from the existing infrastructure and must provide for, among other things, consumer protection, fraud prevention, and authentication and authorization. Moreover, because there are likely to be many different wallets to choose from, it is imperative that interoperability be taken into account to enable a seamless payment experience (for example, by allowing for consistent and effective authentication and authorization), as we discuss in further detail in our response to Question 8 of this comment letter below.

- c. *Tokenization²⁵ of assets:*** While not addressed directly in the CBDC Issues Paper, Ripple would also like to highlight the ability for a general-purpose CBDC to extend the benefits of tokenization to the public. The tokenization of assets can be extended through a general-purpose CBDC by allowing the private sector to develop on the ledger established for the general-purpose CBDC, to create new opportunities for tokenization. Examples include protecting property rights for tangible property (such as property, art, and collectibles) as well as intangible assets (digital rights) via non-fungible tokens.
- d. *Optimizing supply chain workflows:*** Finally, the general-purpose and wholesale CBDC workflows being explored by the RBNZ can also support efficiencies in supply chains by being used to escrow funds and pay invoices. Decentralized exchanges (DEX),²⁶ such that are built into the CBDC Private Ledger, can ease friction in cross-border commercial payments by allowing the payor to choose the currencies they have, and the payee to choose the currencies they want to hold.

Question 7: Do you agree with the design principles that have been developed to capture the opportunities, described in Section 4?

Ripple appreciates the extensive analysis of the design principles undertaken by RBNZ and summarised in Table 2 of the CBDC Issues Paper,²⁷ and we agree with these design principles that have been developed to capture the opportunities of a CBDC.

²⁵ For the purposes of this comment letter, tokenization of assets refers to the process by which an issuer creates digital tokens on the blockchain which represent ownership of physical or digital assets.

²⁶ See <https://xrpl.org/decentralized-exchange.html>, Decentralised Exchange.

²⁷ See CBDC Issues Paper, Page 32.

Question 8: Are there other design principles to capture the opportunities that should be considered?

Ripple would like to highlight the importance of interoperability as a design principle for RBNZ to consider, in order to capture the opportunities of a CBDC. Ripple believes that interoperability - achieved through alignment of national payment protocols and adoption of international standard protocols - will ultimately be core to any successful CBDC design and help avoid creating a closed loop system.

As highlighted in the introductory section of this comment letter, Ripple itself applies protocols to drive the efficient globalization of value through multiple initiatives with financial services and open-source communities, and the CBDC Private Ledger can also be used for both payments and issuing currencies. By leveraging Ripple technologies and the Interledger Protocol, commercial financial institutions and central banks can make cost-effective, reliable and close to instantaneous payments, including at high volumes and for use cases such as micropayments. We believe that similar design choices, including use of standardized APIs, will help facilitate widespread adoption of CBDCs and strengthen the case for their global usage

As highlighted in our response to Question 6 in this comment letter, as the market continues to evolve and develop, we expect there will be many different wallets and wallet providers for users to choose from. While such digital wallets could be used to enable peer-to-peer or wallet-to-wallet payments, infrastructure will need to be put in place that supports interoperability and which also provides for consumer protection, fraud prevention, authentication and authorization, among other things.

Therefore, we respectfully submit that the RBNZ also needs to consider infrastructure that considers technology and data standards so that information could be exchanged seamlessly between the different systems involved in the monetary system. Developing infrastructure that is fully interoperable could well benefit from private sector collaboration and engagement.

Ripple would be supportive of the creation of a task force that involves the public and private sectors collaborating together to exchange ideas and test solutions, and whose efforts are informed by the work on interoperability occurring at the international level.

Question 9: Do you agree with the description of the challenges and risks in Section 5?

Ripple agrees with the descriptions of the challenges and risks of a CBDC identified by the RBNZ and summarised in Table 3 of the CBDC Issues Paper.²⁸

²⁸ See CBDC Issues Paper, Page 33.

Question 10: Are there other challenges and risks that should be considered?

Ripple has no comments on this question.

Question 11: Do you agree with the design principles that have been developed to harness the opportunities and to address the challenges described in Sections 5 and 6 respectively?

Ripple agrees with the design principles that have been developed to harness the opportunities and to address the challenges of a CBDC identified by the RBNZ and summarised in Table 3 of the CBDC Issues Paper.²⁹

Question 12: Are there other design principles that should be considered in respect of the opportunities and challenges described in Sections 5 and 6 respectively?

As highlighted in our response to Question 8 of this comment letter, Ripple would like to highlight the importance of interoperability as a design principle for RBNZ to consider in order to capture the opportunities of a CBDC.

In addition to interoperability, we also feel that it is important for RBNZ to consider user experience and adoption as a design principle, as a general purpose CBDC is heavily reliant on user experience to drive adoption.

It is important to note that payments are a two-sided market, and the use of a new service depends both on user adoption as well as merchant acceptance. Therefore, if a CBDC issued by RBNZ is to achieve its policy goals, it will need to be widely adopted by both consumers and merchants. Any assessment of user experience to encourage user adoption will need to be forward looking, and take into account both the present and possible future demands of consumers.

At the same time, it will likely be necessary to quickly onboard a large merchant base in the beginning, in order to drive user adoption and ensure the CBDC is useful to users right from the start.

The CBDC design principles should therefore encourage and incentivise user adoption in order to build network effects.

²⁹ See CBDC Issues Paper, Page 33.