RESPONSE TO REQUEST FOR COMMENT FROM FEDERAL RESERVE ON FEDNOW SERVICE

R3 welcomes the opportunity to respond to the request for comment from the Board of Governors of the Federal Reserve System regarding the adoption and implementation of the FedNow Service. We are excited to engage and offer our observations on this important innovation.

The considerations raised by the Governors are ones R3 has considered closely as we evaluate our own technology and its appropriate use cases. We broadly support the criteria put forth in evaluating a FedNow Service. In particular, we regard the public benefits criterion to improve the effectiveness of financial markets, reduce risks in payments and securities-transfer services, and improve the efficiency of the payments system as critical to a successful FedNow Service.

Investments in blockchain[1] solutions have seen a marked increase over recent years, especially in those that are fit for purpose for financial services. As R3's own blockchain platform was designed especially for this kind of enterprise usage, our response below offers a set of considerations from the perspective of a financial technology (FinTech) provider.

Introducing R3

R3 is an enterprise blockchain software firm working with a broad ecosystem of more than 300 participants across industries, in the public and private sectors, to develop applications on Corda, its open-source blockchain platform, and Corda Enterprise, a commercial-grade version. R3 boasts a global team of over 250 professionals in 14 countries, and is supported by over 2,000 technology, financial, and legal experts drawn from its global user base.

Throughout the development of our own blockchain platform, regulators and central banks have been key to our approach to innovation and are an integral part of our ecosystem. R3 strives to raise the bar in regulatory engagement for a growing technology firm, and as such, engages with regulators, government stakeholders and policymakers at all levels. Our vigorous government affairs efforts have allowed for the continued incorporation of regulatory requirements into the design and development of our software. Over 30 regulators and central banks count themselves as official members of our network, which creates a mutually beneficial relationship. Through their membership, regulators and central banks are able to stay current in blockchain innovation and also actively participate in projects and trials.

R3 believes blockchain technology is already demonstrating its transformative potential. The financial impact of blockchain solutions will be broad and significant. Financial services companies and businesses more broadly can expect to see significant reductions in cost across the lifecycle of a transaction as technology solutions replace legacy systems and

[1] We use the term "blockchain" in this letter. However, where we use "blockchain" it could be interchanged with "distributed ledger technology" or "DLT."

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processes. We also anticipate a far reaching and material mitigation of operational risks associated with those legacy systems once replaced by blockchain solutions.

R3's Corda Platform

Corda is R3's blockchain platform that provides the infrastructure underpinning a growing ecosystem where software applications (called CorDapps) are being developed and deployed to solve real world problems. The fundamental design decisions of Corda allow for limited data sharing and facilitate compliant transactions between regulated institutions subject to reporting and data privacy regulations, which distinguish Corda from public and permissionless blockchain platforms.

Corda has developed significantly over the past several years, and R3 went to market with our first enterprise version, Corda Enterprise, in July 2018. As an enterprise-grade blockchain platform, Corda removes costly friction in business transactions by enabling institutions to transact directly (peer-to-peer) using smart contracts, while ensuring the highest levels of privacy and security. This provides value to the economy and consumers. For financial services, the reduction in operational risk and clearing and settlement times offers users the opportunity to meaningfully lower the amount of money necessary to hold in reserve to meet capital requirements.

Corda is being deployed in industries from financial services to healthcare, shipping, insurance, and more. It records, manages, and executes institutions' financial agreements in perfect synchrony with their peers, creating a world of frictionless commerce.

Originally built by the financial services industry for the financial services industry, Corda leverages the power of blockchain to address specific business challenges in highly regulated markets. Corda is fit for purpose in such markets, and therefore promotes financial security and market integrity. We share the priorities of our partners and developers: we are focused on technology that ensures system security, appropriate risk mitigation, and ownership traceability, as well as the ability to safeguard assets.

It is these priorities and the design features discussed above that led to SIX Swiss Exchange to choose Corda as the underlying blockchain technology for its digital asset listing, trading, settlement, and custody service named SIX Digital Exchange (SDX). R3 has also been a partner of choice for several central bank digital currency (CBDC) projects. One of our most successful to date brought together the Bank of Thailand and private banks to understand the implications of decentralized RTGS and cross-border payments with wholesale CBDC on payment operations and banks' business models within a regulated environment. The 2018 work led to further exploration of CBDC in 2019, with a view of contributing the findings into the future design of Thailand's Financial Market Infrastructure framework. Similarly, our close collaboration with the Bank of Canada and another partner in the region during 2017 and then again in 2018 led Project Jasper into phase three in developing a POC on an equity trade cleared and settled on Corda.

RESPONSE

R3 offers its support for the development of faster payments through the FedNow Service (the "Service"). From our own engagement and expertise in the industry, we believe a 24/7/365 RTGS service is essential to allowing the US financial system to benefit from the rapid innovation in payments and digital assets, and is especially crucial to ensuring all public benefits from these advances have the widest reach.

The sheer pace of payments innovations supports the need for urgency in developing the FedNow Service. While Facebook's Libra is the industry's most-followed development this year, many others, from traditional financial institutions to technology firms, are heading to market with innovative payment services while building a future market for digital and tokenized assets. R3 expects the volume and velocity of these developments to increase over the next three years. Within our own Corda user-base, companies like SWIFT and Mastercard are not only making significant progress in improving payment services, but are doing so by paying special attention to the underlying technology on which these payment services are built.

In a recent development, which highlights the uptake we are seeing from sophisticated legacy infrastructure providers, SWIFT announced their intention to integrate SWIFT gpi with Corda using the Corda Settler application. This development means banks will no longer be required to continuously message, email, or call recipient banks to confirm a payment has been made, but can instead use Corda to perform a smoother, more efficient process.

Similar to the experience of SWIFT and others in making improvements to large and critical infrastructure, the potential benefits of FedNow can be even further maximized by adopting the most advanced and secure technology to underpin the Service. Given that the evolution in payment services in recent years contributed to the need for a 24/7/365 RTGS system, the Board of Governors has a unique opportunity to upgrade infrastructure in a way that ensures it can continue to benefit from these innovations and avoid the costly need for an overhaul every several years. As such, R3 suggests the Board of Governors consider the needed requirements for such a system to ensure it has flexibility and capacity to participate in payment and digital asset innovations that will come of age at the anticipated time of the Service's launch.

Specifically, to "future-proof" FedNow, R3 suggests the Board of Governors consider the use of a blockchain-augmented solution for the Service. As merely a layer of FedNow's design, the Service could adapt to any advances in token-based payments and settlements, while maintaining complete continuity of operations. By building capacity for blockchain into FedNow, the Board of Governors would ensure they have the means to test, pilot, and gradually adopt technological innovations only as it advances the implementation of their monetary policy.

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A recent study[2] completed by SAP and Accenture tested Corda's ability to deliver a solution that incorporates blockchain technology alongside RTGS, without the need to displace the role of traditional payments. From those results, it is evident there is significant overlap between what a blockchain-augmented RTGS could provide and the public benefits criterion and measures of success outlined for the FedNow Service:

> **Efficiency:** Improving Effectiveness of the Financial System – As blockchain solutions like Corda can facilitate direct "peer-to-peer" transactions, a further reduction of friction within the Service would ultimately increase its efficiency by compressing the settlement cycle, further enhancing the public benefits to banks and their consumers. In reducing settlement times, that ability to achieve atomic delivery vs. payment and payment vs. delivery provides liquidity-savings, which we recognize as an important concern identified in the Notice.
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> **Safety:** Reducing Risk Associated with Payments and Securities-Transfer – Enabling banks to conduct settlements directly with one another would not undermine the overall safety of the Service. In fact, risks are mitigated simply though the decentralized design of the blockchain solution by reducing the existence of single points of failure.
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> Additionally, there is opportunity to advance the overall mission of the Federal Reserve. On permissioned networks like Corda, this is enabled through the transmission of only the necessary "metadata" such as transaction amounts, times, etc. This design feature would preserve the privacy of Service users while growing significantly the oversight and supervisory ability of the Board of Governors, as well as provide meaningful data to inform policy decision-making.
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> **Accessibility:** Promoting Integrity of the Payments System – The increased data transparency described would enhance the integrity of FedNow, but importantly, would not stymie the increased accessibility offered by the Service. In fact, its interoperable design means it can be taken advantage of by those users who desire, while not excluding or producing negative externalities to users who do not. Interoperability in the case of Corda means users of a blockchain-augmented solution can still settle over non-blockchain or conventional platforms. A technologically interoperable FedNow serves to insulate it from the risk of becoming outdated, and enables it to participate in payment system developments as desired by the Board of Governors.

Looking to the future, the evolution of faster payments will give way to wider adoption of digital assets in the form of digital currencies, securities, and other tokenized assets. R3 recognizes work the Federal Reserve and other central banks have completed in considering

[2] Accenture and SAP® Build Prototype that Uses Distributed Ledger Technology to Enable More Efficient, Secure and Reliable Payments Between Banks and Customers. https://newsroom.accenture.com/news/accenture-and-sap-build-prototype-that-uses-distributed-ledger-technology-to-enable-more-efficient-secure-and-reliable-payments-between-banks-and-customers.htm

how best to harness these developments for public benefit. However, given the rapid adoption taking place in the private sector, we believe it is important the FedNow Service has the capabilities to respond to the changing needs and demands of its users. The creation of a blockchain-augmented FedNow would position the Federal Reserve System for leadership in this area, as settlement over a blockchain-augmented solution would occur through the use of tokens that represent other assets like central bank reserves.

In our suggested use case, a wholesale digital currency issued by the Federal Reserve (a "central bank digital currency," or "CBDC") would immediately enable atomic payment vs. payment and delivery vs. payment as well as increased security due to the distributed infrastructure. In the future it will also provide for digital asset integration, shorter settlement times (as short as T+0), frictionless cross-border payments, and liquidity savings. As the solution and the corresponding CBDC can be completely designed to suit the needs of the Service and its users, the Federal Reserve could ensure the system not only fully meets the objectives set forth in the Notice, but reinforces its supervisory capacity and positions itself for integration with digital asset innovations.

R3 recognizes the addition of a blockchain-augmented solution to the FedNow Service increases the ambitious nature of the current timeline. However, given the rapidly developing industry for digital payments and settlements, we believe additional innovation from the Board of Governors is necessary for the long-term success of the FedNow Service.

We are keen to work with the Federal Reserve System to further our shared interest in seeing the development of payments infrastructure that increases safety, accessibility and efficiency in the market, and delivers public benefits to the furthest possible extent. We believe the recommendations and standards set forth in the Notice are appropriate and aligned with those goals, and welcome the opportunity to continue our engagement beyond this response and to discuss these issues in detail at any suitable opportunity.

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