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Department of Commerce
National Telecommunications and Information Administration
Washington, D.C. 20230

In the Matter of)	
)	
Public Wireless Supply Chain Innovation Fund)	Docket No. NTIA-221202-0260
Implementation)	RIN 0693-XC05
)	

COMMENTS OF RAKUTEN SYMPHONY

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Rakuten Symphony, Inc. (“Rakuten Symphony”) appreciates the opportunity to provide input to the National Telecommunications and Information Administration (“NTIA”) regarding its request for comment (“RFC”) on the implementation of the Public Wireless Supply Chain Innovation Fund (“Wireless Innovation Fund” or “WIF”), as directed by the CHIPS and Science Act of 2022.

I. Introduction

Rakuten Group, Inc. (“Rakuten Group”) was born in Japan, one of the strongest global allies of the United States. It is a global leader in technological innovation and has made major investments in, and acquisitions of, U.S. companies. Rakuten Group continues to have a robust presence and development in the U.S. Rakuten Mobile, Inc. (“Rakuten Mobile”) is a subsidiary of Rakuten Group that delivers world-class wireless services to more than 5 million subscribers. Rakuten Symphony also is a subsidiary of Rakuten Group dedicated to the development and distribution of open radio access network (“Open RAN”) technologies. Together, Rakuten Group, Rakuten Mobile, and Rakuten Symphony are strongly supportive of the U.S. government’s leadership in and support of next-generation technologies.

Rakuten Mobile is unique in being the only mobile network operator in the world to successfully plan, build, and operate a fully cloud-native, end-to-end, software-defined Open Radio Access Network (“Open RAN”) at scale. The network was delivered four years ahead of schedule and has over 56,800 live commercial cell sites providing service quality at performance levels either meeting or exceeding those offered by legacy networks. Because of Rakuten Mobile and Rakuten Symphony’s relentless pursuit of automation, the whole network is managed efficiently by only 250 people, compared to the tens of thousands of workers required to operate traditional telecommunications systems. This modern approach has also reduced 40% of capital expenses and 30% of operating costs versus a traditional wireless network deployment.¹ Rakuten Mobile is an example today of the future of wireless networks.

Rakuten Symphony is designed to share that learning and technology with the world and brings the same hyper-scale economics and speed of modern progress to the mobile telecom

¹ See Linda Hardesty, *Analysts confirm Rakuten Mobile’s network saves 40% capex on a per site basis*, Fierce Wireless, available at <https://www.fiercewireless.com/wireless/analysts-confirm-rakuten-mobiles-network-saves-40-opex-site-basis> (Jan. 11, 2022).

space. The true change Rakuten Symphony brings is an increase in the accessibility, transparency, and programmability of the systems — critically, either for greenfield network builds or inside within the existing legacy approaches. Increased visibility into the network allows for the release and analysis of situational operational data and autonomous interpretation and control, thus radically improving real-time performance, energy management, and security awareness. That is to say, operators can see how their networks are performing in real time and optimize or mitigate immediately—all for the benefit of wireless consumers. Through artificial intelligence and machine learning (“AI/ML”), Rakuten Symphony is building automated networks and, in doing so, moving the entire telecommunications industry forward.

The latest example is Rakuten Symphony’s partnership with 1&1 AG, the new fourth mobile network operator (“MNO”) in Germany, which began rolling out Europe’s first Open RAN network in December 2022. With a range of trusted suppliers, 1&1 AG is also the only MNO in Germany that does not use Huawei antennas.² Additionally, Rakuten Mobile and Rakuten Symphony have launched Open RAN labs in Japan and India, with an Open RAN Customer Experience Center in the United Kingdom planned by March 2023.³

The Wireless Innovation Fund presents a unique opportunity for the U.S. and its trusted allies to address the diversity and security of supply chains, foster technological innovation, and promote transparency and interoperability in networks. Rakuten Symphony believes that the only way to continue the positive momentum in wireless innovation is to adopt truly open and transparent interfaces. This will ensure that the telecommunications supply chain remains diverse and competitive and that operators and the consumers who rely on them can benefit from more nimble, cost-effective networks. Rakuten Mobile and Rakuten Symphony are committed to transparency, which we believe will accelerate the opportunity for success across the whole technology stack and drive improvements in performance and security in the wireless industry.

² See “1&1 AG: First European mobile network based on innovative Open RAN technology successfully launched,” EQS-News, *available at* <http://88.217.133.43/link.php?isin=DE0005545503&typ=corporate&von=19970101&a=10&sprache=de&v=de&id=1725633> (Jan. 3, 2023).

³ See “Rakuten Mobile and Rakuten Symphony to Build Open RAN Customer Experience Center in the UK,” Rakuten Symphony, *available at* <https://symphony.rakuten.com/newsroom/rakuten-mobile-and-rakuten-symphony-to-build-open-ran-customer-experience-center-in-the-uk> (Nov. 21, 2022).

Rakuten looks forward to the opportunity to work together with NTIA to achieve this outcome and for the ability to participate in this request for comment. The main themes Rakuten Symphony will highlight include the following:

- It is essential to fund activities that build, integrate, test, and deploy Open RAN networks in the marketplace.
- We encourage NTIA to fund Proof of Concept, small-scale brownfield and enterprise 5G deployments, which will accelerate commercial adoption, encourage private investment, spur innovation, and foster industry-wide best practices.
- NTIA should prioritize measurable deployments and global adoption rates. Spurring ubiquitous Open RAN will lead to increased U.S. competitiveness in advanced wireless markets.
- To bring Open RAN to scale, the United States must work with trusted allies and partners. By embracing the collaborative and global Open RAN ecosystem, the U.S. Government can inspire like-minded governments to provide similar assistance programs to help advance mutual telecommunications goals.

II. The State of the Industry: Challenges and Open RAN Solutions

The main challenge with delivering Open RAN today is the foundational change to the standard delivery model in wireless networking. In traditional RAN systems, pre-assembly and end-to-end certification of hardware and software happen with a single vendor behind closed doors. A very high percentage of the Radio Access Network is built upon the radio, the baseband or the distributed unit (“DU”) that drives the radio to occupy a particular channel in each band of operation. Incumbent vendors deliver the radio unit (“RU”), DU and the centralized unit (“CU”) along with a proprietary Network Management System (“NMS”) as one integrated and turnkey solution to the operators, which forces an operator to select the RU, DU, CU and NMS from that single vendor (the DU and CU are typically offered as a Baseband Unit on proprietary hardware). A fully working system is delivered from that vendor’s factory and deployed as a silo, often with locked-in long-term contracts that discourage innovation and impede competitive choice.

By contrast, with Open RAN, separate components become available for delivery from different vendors. Operators can choose what configuration of components works best for them, as opposed to having to pick from the few full-stack solutions available to them.

Rather than demanding reliance on one vendor, one roadmap, and one potentially vulnerable supply chain from a single company, the power of Open RAN is that it allows the most appropriate component to be deployed in the most applicable scenario. The open interfaces allow one common operational model and one control channel to be deployed over any number of radio vendors. The Open RAN model thereby creates supplier diversity and optionality of assembly at the point of consumption rather than at the point of manufacture.

Open RAN changes the traditional roles of supplier versus customer and requires new skill sets in the areas of software and distributed deployment and automation. For existing public networks, the challenge stems from a legacy closed footprint and resistance by incumbent vendors to open those interfaces in the installed base. But with today's greenfield networks, a company can build from scratch without being saddled with older, slower, bundled legacy equipment.

With Open RAN, all interfaces are open, including the most important interface – the interface between the open radio unit (“O-RU”) and the open distributed unit (“O-DU”), allowing the operator to select the best-in-class O-RU vendor and best-in-class O-DU software vendor. Likewise, open interfaces enable the operator to deploy the open centralized unit (“O-CU”) vendor of choice. Open RAN also enables operators to deploy O-DU and O-CU software on commodity hardware versus the legacy incumbent approach of only deploying on their custom and application-specific hardware.

A critical challenge for Open RAN is that hardware economies of scale have not yet materialized. With the increase of spectrum made available by regulators for mobile networks over the last few decades, the number of frequency bands and band combinations for O-RUs has increased sharply. Many of these new bands and band combinations are country specific or operator specific, leading to a reduced addressable market for O-RUs serving a particular band combination. This has resulted to a underdeveloped hardware ecosystem for remote radio head and Massive MIMO advanced antenna systems.

Cost of hardware is driven by volume commitments. Rakuten Mobile is the first of just a few operators deploying Open RAN in large volumes. For brownfield operators, volumes for initial Open RAN deployments are just beginning to develop. As Open RAN is at the beginning of the volume ramp, cost erosions for Open RAN hardware have not yet materialized. In addition, due to the extreme vendor consolidation in the marketplace, the traditional vendors have continued to enjoy significant radio volumes despite their high prices.

While the O-RU remains Open RAN's only application specific appliance, the software based O-DU and O-CU are benefitting from economies of scale of general purpose compute platforms. While these have significant advantages over traditional baseband appliances, more work must be done. The compute intensive O-DU will especially benefit from continuous technology integration to achieve capacity and cost objectives. Rakuten Symphony is closely collaborating with Intel Corporation on a Next Generation Distributed Unit multipurpose edge appliance which combines cell site routing functionality and a containerized DU on a single general purpose server platform. Intel's new central processing unit with an embedded hardware accelerator is a step in the right direction. The Wireless Innovation Fund can play a critical role in further accelerating hardware development to advance the Open RAN ecosystem.

Another critical challenge for Open RAN is industry resistance to evolve. Adoption of Open RAN requires a change in the mindset of the industry, evolving from the traditional approach to the web-scale method of deployment with fewer manual interventions and a plethora of automation methods and techniques. This evolution also requires re-skilling the existing workforce with the required tools to learn and operate large-scale networks and network densification.

Operators have invested tremendous sums of money to acquire large quantities of cellular spectrum. They have spent even more on the features and functionalities that have been delivered by incumbents over the past two decades in the transition from second-generation or 2G to fourth-generation ("4G") cellular networks. Replacing or even adding a new vendor to the mix requires additional investment and a longer-term commitment by the operator.

The dramatic consolidation in the vendor marketplace, along with decreasing average revenue per user ("ARPU"), and faster and cheaper wireless cellular access demanded by consumers, have inclined operators to favor the traditional turnkey approach over the Open RAN

method of building and deploying telecommunication networks. Additionally, in order to block or slow the adoption of new technology, some incumbent vendors have chosen to reduce prices artificially and use other techniques to recover those costs from the operator, usually in the form of customizations and services. This is a classic “innovator’s dilemma,” to borrow from the famed book of the same title. The legacy model may be a profitable one, but it is not innovative or competitive. Open RAN is the singular disruptive innovation that threatens the status quo (to the benefit of operators and consumers).

As the systems integrator, Rakuten Symphony reduces the complexity of integrating across various vendors by taking ownership in driving the cross-vendor interoperability conformance and compliance. Since the vendors participating in the Open RAN ecosystem are building products with open interfaces, systems integration is a necessary exercise to deliver a coherent product to operators and effective service to the end customer.

Rapid onboarding of new applications with automation on a target platform can only be realized by providing an environment that can host, integrate, test, and deploy the applications. By creating an environment that allows application developers a sandbox to play with and validate their change sets, Rakuten Symphony attempts to offer the first and only “telecom marketplace.” Such a telecom marketplace can allow operators to choose and license the type of applications that would allow them to deploy and operate their network optimally and with high availability.

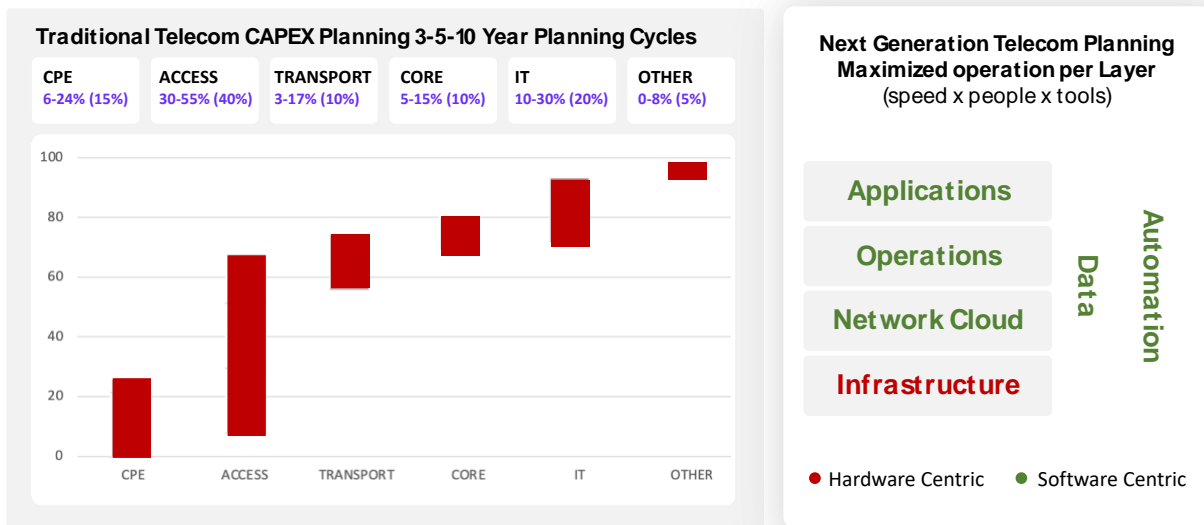
Similarly, Rakuten Symphony’s Symware provides an alternative to the operators to build and customize hardware configurations from commodity vendors to achieve the best Three-P key performance indicators—price, performance, and power—from the underlying hardware. Symware is a reference design that Rakuten Symphony makes available in the open market for anyone to license. It comes in an environmentally hardened appliance that can be deployed externally and exposed to severe weather. Symware can also be customized and deployed as a rackmount server configuration with multiple sleds.

Barriers and Solutions for Brownfield Deployments

In many circumstances, new deployments must co-exist with existing deployments. Open RAN is designed to accommodate this co-existence. Foundationally, it introduces an

entirely new way to plan, build, and operate networks and is most effectively adopted in parallel to scaling automation and cloud practices. An Open RAN brownfield deployment requires a new mental model and new skillsets across the whole industry to change strategy, planning and operations from being vertical stovepipes to being horizontal layers (*see Image 1*).

Telco CAPEX Planning: Traditional vs. Next Generation



From Vertical to Horizontal, To unlock layer appropriate value, cost, speed

Image 1.

Credit: <https://techeconomyblog.com/2022/07/06/the-nature-of-telecom-capex/>

Operational logistics in configuring, monitoring, and managing telecommunication networks have become excessively complex and exceedingly expensive to upgrade and maintain, akin to the mainframe problem the world faced with the “Y2K” problem. Bulky existing systems impede technological innovation when it comes to AI/ML, or even simple closed-loop-automation. Open RAN brownfield deployments must be introduced as an augmentation strategy to existing operators’ networks, allowing for migration and growth of legacy systems modernized with new, scalable, and intelligent software-based techniques and future technologies.

The industry is migrating away from legacy virtual machine deployments of software virtual network functions (“VNFs”) to cloud-native network functions (“CNFs”). This is a significant because the two run on very different software designs, cloud platforms, and

packaging paradigms. While this migration requires significantly more automation (a major change for operators), it does not mean converting VNF to CNFs. The solution is finding a unified cloud-native system that can also directly accommodate VNFs — a technology already in use by Rakuten Mobile.

A focus on the following areas will help ease brownfield transitions for operators:

- New locations or scheduled location upgrades; and
- New service deployments that require an updated RAN;
- Addition of new edge and latency applications;
- Extensions into new private fifth-generation (“5G”) networks;
- End of Support milestones for 3G and 4G solutions provide a path of lesser resistance for improvements and modification.

With the re-farming of 4G spectrum to be used for 5G networks underway, several operators are going through the pain of upgrading proprietary closed RAN systems with new hardware that can support 5G both in the DU and RU. This is another example of vendor lock by the incumbents where the operator is unable to make a preferred choice for network modernization with new technology and software that leverages both open source and open interfaces. In the case of Open RAN, such a migration could be easily made possible as a software upgrade that supports both 4G and 5G on the same hardware. Open RAN also supports cloudification of the RAN, enabling a seamless migration with resiliency and redundancy built into the infrastructure. This is something that the closed RAN ecosystem can never support.

While coverage and capacity have increased 10-fold with each generation of the 3GPP specification, so have the number of base stations and deployment scenarios to deliver high bandwidth to the end user. Legacy methods of building and deploying large scale telecommunication networks even from 4G will not scale to meet the increasing demands in 5G and beyond. Open RAN’s web-scale, fully-automated mode of handling the operational logistics of large-scale densification is the solution.

III. Momentous Opportunity for Supply Chain Diversification

Open RAN faces resistance to change from a risk, incentive, and incumbency perspective. Mobile networks offer critical services that cannot afford outages and some argue (wrongly) that trying a new approach puts these service expectations at risk. This is coupled with a lack of incentive and reward if the new model is proven to work. Incumbent vendors are not as innovative, and any diversification of supply chain threatens status quo revenues, even those that are declining as mobile operators continually generate less top line revenue and need to optimize supply further. Incumbent vendors play a standard support, resist, and control role with respect to efforts to promote Open RAN.

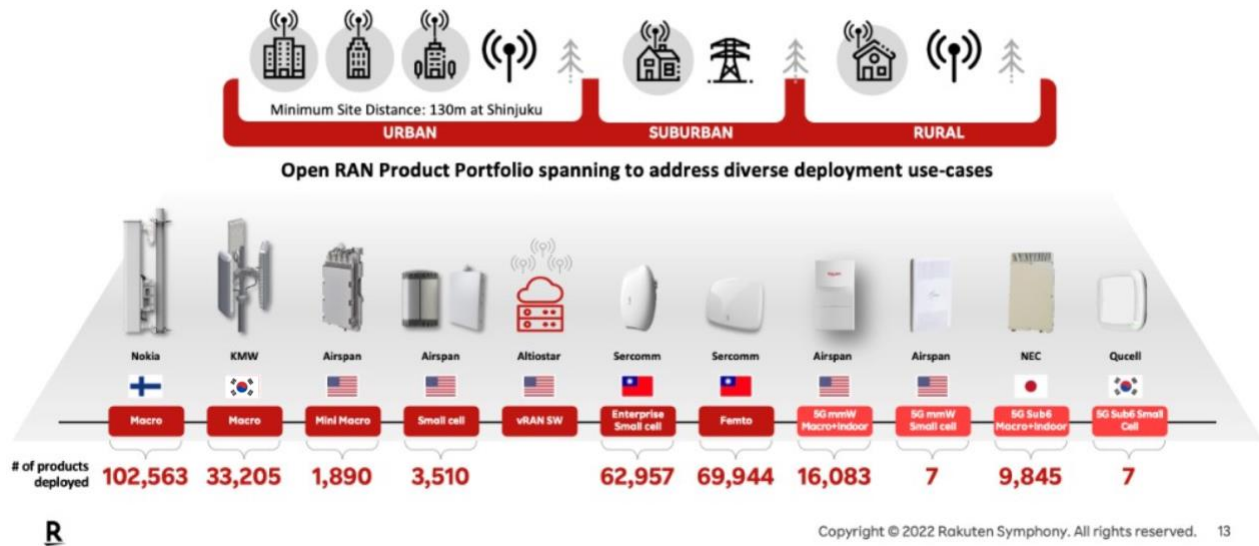
Global telecommunications supply chains have been taken to the extreme, with only three main vendors to choose from in the West. The existing supply scenario causes undue bias and control of the mobile operator customer base and procurement cycles are secured generationally. However, due to national security concerns, several countries are undergoing the removal and replacement of untrusted networking equipment with a more diverse supply side solution. This presents a unique and momentous opportunity to introduce diversification, increased innovation, and competition to the existing supply chain. However, time is not on our side. Given the consolidation of the marketplace and reported Chinese state support for domestic vendors that further undermines free-market competition, it is critical to innovate our way out of this problem, and to do so now.

Rakuten Mobile and its existing radio supply diversification present a live case study of what is possible if the desire for supply diversification is enabled (*see Image 2*). With a closed RAN ecosystem and vendor lock-in, the operator has no choice but to buy the RU and supporting DU from the incumbent vendor they had previously selected for 4G. This takes time and, if the operator is not Tier-1, it risks losing the opportunity to lead and win in the marketplace. Tier-1 operators are usually prioritized by the incumbents, but they also must wait for the new radio to be developed. With Open RAN and systems that are built with open interfaces, any operator can select from a wide variety of RU and DU vendors to create a best-in-class solution that meets the time to market requirements of the operator.

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World's Largest HetNet Open RAN Deployment

Over 300k cells powered by appliances from a large set of vendors with ONE unified, common software layer



(Image 2)

IV. Technology Development and Standards

For Open RAN technology to gain market traction, funding small-scale deployments should be a high priority. Building and commercially deploying a Radio Access Network begins with a small-scale deployment. This proof-of-concept (“POC”) phase is capital-intensive and requires significant time and labor. There are many costs such as site acquisition, site permits, site security, and transport that multiply as the size and the number of such engagements increase with different operators. The POC process is vital, but the commitment of resources required of new vendors is a barrier to Open RAN adoption due to the significantly lower burden placed on incumbent vendors. For the Wireless Innovation Fund to contribute to the success of an open and fair ecosystem, it is essential to fund activities that build, integrate, test, and commercially deploy Open RAN networks.

When an operator considers an open network, the question inevitably arises of how to make all the vendors work together. While cooperation amongst vendors is essential, it is not a stumbling block. Vendors that work in an open environment, centered around disaggregation, usually adhere to standards. These vendors understand that their ability to quickly demonstrate

interoperability in POCs is a key to success. Additionally, in today's world of containerized software, vendors can quickly change, test, and deploy new code.

The Fund should support end-to-end solution interoperability. End-to-end solution interoperability and efficiency are necessary up and down the operations stack. For example:

End-To-End Services (protocol interoperability): Open RAN to 5G core; user equipment (“UE”) mobility management; UE handover in home and visited networks; inter-operator security points, for example the security edge protection proxy.

Operations Stacks: harmonizing VMs and containers to share resource pools; remote bare metal orchestration; remote-tuning of network functions and supporting applications; overlay/underlay networking; fast, simplified and flexible instantiation of network functions, applications and services; ongoing lifecycle management; Open RAN and its related application programming interfaces are important, but not all of them have been defined by the O-RAN Alliance.

Vendors and systems integrators chosen to participate in potential Wireless Innovation Fund POC projects should provide a complete and interoperable solution that includes 5G network functions, hardware cloud platforms, and orchestration systems.

Funding intelligent RAN management would aid the development of a near fully autonomous network transformation in 5G and beyond. As coverage and capacity continue to increase with each generation, so does the complexity of frequency and interference management. Advanced Radio Resource Management techniques and algorithms require a more centralized approach to extract the best efficiencies of the allocated and deployed spectrum for uplink and downlink configurations. Such algorithms, both near-realtime and non-realtime, require the addition of a new architecture that can facilitate and deliver this intelligent management of the RAN. Rakuten Symphony has been driving the related xApp and rApp development for various closed loop and centralized SON algorithms.

NTIA should fund AI/ML-based energy orchestration projects that will reduce RAN power consumption in the RU, DU, and other functions. Energy consumption by telecommunications networks is rapidly rising. The status quo is costly, inefficient and failing to respond to the global climate change threat. Open RAN networks should be the industry

vanguard in dramatically reducing RAN energy consumption. AI/ML-based energy orchestration makes this possible by predicting and diverting energy from unused resources and optimizing energy usage at the microchip and server level.⁴ Sustainability can be achieved without sacrificing network performance or user experience, and WIF funding would accelerate the delivery of this technology to the marketplace.

Rakuten Group’s commitment to reducing energy consumption extends beyond mobile networks. In September 2022, Rakuten Group, including consolidated subsidiaries, announced the goal of achieving carbon neutrality from business operations in 2023. As a member of the “Renewable Electricity 100%” or RE100 initiative, Rakuten Group prioritizes the adoption of renewable energy and, in 2021, achieved 100 percent renewable energy adoption for electricity used in business operations, with an overall renewable energy rate of 20.6 percent.⁵

The Wireless Innovation Fund also presents an opportunity to address the lack of a fully functioning market for the open standard RU. The proliferation of split spectrum bands has created a fragmented market for RU vendors. This is less of an issue for private networks, which generally use one or two frequency bands. The lightly licensed CBRS spectrum has become the spectrum band of choice for private networks.

Accelerating the Commercial Deployment of Open RAN

Small-scale brownfield deployments are necessary to accelerate the adoption of Open RAN. Such deployments will spur greater activity in the marketplace, leading to more innovation and a more resilient and diverse supply chain. As discussed previously, new technology adoption is hampered by the cost of POCs. Conducting a POC is necessary to demonstrate and justify the use of Open RAN and to prove that its benefits can be delivered in an operator or enterprise’s specific operating environment.

In practice, conducting a POC for six months, with five to ten tower sites, costs millions of dollars. Over half of that cost is attributed installation and integration services. The cost catalog

⁴ See “AI-driven smart network energy management with Rakuten Symphony,” Rakuten Symphony, *available at* <https://symphony.rakuten.com/blog/ai-driven-smart-network-energy-management-with-rakuten-symphony> (Feb. 26, 2022).

⁵ See “Rakuten Announces Goal to Achieve Carbon Neutrality in 2023,” Rakuten Group, *available at* https://global.rakuten.com/corp/news/press/2022/0928_01.html (Sept. 28, 2022).

included in the *Supply Chain Reimbursement Program Study* commissioned by the Federal Communications Commission generally provides a good indication of cost.⁶

NTIA is encouraged to use funding to stimulate the deployments of vendor-neutral Network Management Systems (NMS) and Operations Support Systems (OSS). Another key issue for brownfield deployments is the proprietary nature of RAN vendor-specific NMS and OSS. Introducing a new RAN vendor in a brownfield environment will require the deployment of a new NMS, since the existing NMS generally will not manage the new open standard vendor. Adding a second NMS or OSS can be cost-prohibitive for public networks due to high integration costs.

Rakuten Symphony solved this problem in its public network in Japan by deploying a modern, cloud-native and vendor-neutral OSS. This enables Rakuten to take advantage of open standard network elements. There is no reason why this solution could not work in the United States, with the support of the Fund.

The Wireless Innovation Fund has the opportunity to jumpstart Open RAN “private 5G” in the United States. Private 5G networks will eventually consist of an ecosystem of partner companies to create new services and solutions. This is increasingly important in private 5G since there is no one-size-fits-all solution. User application requirements will vary depending on size, industry, applications, and desired operating models, and they will evolve as business needs change. Furthermore, private 5G and 5G spectrum may not be available in all areas, causing the deployment of a hybrid or full LTE network while waiting for 5G availability. The benefits of jumpstarting Open RAN private 5G in the United States are vast, including:

- Speeds ten times faster than current 4G networks;
- Quality of service improvements via massively improved reliability, network slicing, and more economical architectures;
- Ultra-low latency, down to one millisecond, enabling real-time interaction for time-sensitive industrial automation, autonomous operations and interactive video;
- Enhanced security for privacy protection and a new authentication framework; and

⁶ See FCC, *Supply Chain Reimbursement Study*, submitted by Widelity, Inc., available at <https://docs.fcc.gov/public/attachments/DA-21-355A1.pdf> (Mar. 25, 2021).

- Rapid deployment with virtualized and cloud-native components.

In evaluating candidates for private 5G projects, NTIA should consider need of the technology, hosting requirements, size of the deployment, and security requirements.

V. Rakuten’s Secure Operations Principles

Rakuten Symphony has implemented a total security approach for Rakuten Mobile’s cloud-native Open RAN network in Japan. Rakuten Symphony’s platform is built on key secure operations principles, with strong adherence to O-RAN Alliance⁷ and 3GPP⁸ security principles. To enable security at every level of the communications stack and achieve a robust security posture requires trusted transparency and visibility, working within a trusted supply chain that continuously verifies the trust level of the system, including all physical, virtual, hardware, and software components. This process allows mobile network operators to gain a deep understanding of, and visibility into, the interactions between the various components of the Open RAN architecture.

Rakuten Symphony is actively sharing best practices on network security and seeking collaboration across the telecommunications industry. However, the technologies adopted in the new open cloud-based 5G standards paradigm have been secured in other industries for many years, making it essential to adopt practices and collaborate outside telecommunications as well. In 2022, Rakuten Symphony published *The Definitive Guide to Open RAN Security* as well as *The Definitive Guide to Telco Cloud Security*.⁹

Rooted in the principle of “never trust, always verify,” Rakuten Symphony’s platform provides Zero Trust Networking capabilities such as micro-segmentation and policy-based firewalls to prevent lateral movement within the platform, in addition to advanced run-time capabilities for Layer 7 threat detection and prevention. By establishing trust assessments for each component, applying trust level policy for each network zone, and implementing policy enforcement through automated updates, Zero Trust Access ensures the architecture has rigorous identification, authentication, authorization, and accountability of any

⁷ Rakuten Mobile serves on the board of the O-RAN Alliance.

⁸ Rakuten Symphony and Rakuten Mobile are Individual Members of 3GPP.

⁹ See “A Next-Generation Approach to Security in Mobile Networks”, Rakuten Symphony, *available at* <https://symphony.rakuten.com/security>.

subject requesting access to any object (resource) within the platform. In other words – and critically considering how central wireless networks are in commerce and consumers’ experience – an open network can and would be a secure network.

VI. Accelerating Global Adoption Requires A Global Ecosystem

Global scale and deployment are necessary to achieve significant progress in the advancement of Open RAN. Continued collaboration and broad participation in the Wireless Innovation Fund will lead to greater familiarity, accelerate adoption, and cultivate a healthy wireless ecosystem.

To achieve the program’s intended goals, the Wireless Innovation Fund should embrace the global Open RAN ecosystem. Rakuten Symphony supports the following comments of the Open RAN Policy Coalition¹⁰ in response to the NTIA’s request for comment:¹¹

“In practical terms, serving the interests of U.S. taxpayers will require WIF investments to be utilized by a wide variety of global operators, manufacturers, and research and development institutions. The interests of the United States and its companies and workers are best served by a robust and resilient trusted global marketplace of companies within the United States and in partner countries with deeply integrated technology markets that compete to develop and sell components and software for use at all layers of the network stack. A global trusted market will support the diversity of trusted suppliers that U.S. operators and the 5G market will need in the future, and also support the sales needs of U.S.-based suppliers. Further, efforts to promote a global market that encourages vendors based in both the United States and its global partners will not only advance competition and innovation but will also help ensure those partners themselves benefit from secure networks, satisfying another core U.S. national security interest.”

In developing Wireless Innovation Fund rules and requirements, it is important to take in consideration:

- Trusted entities with a track record in the advancement and commercial deployment of Open RAN.

¹⁰ Rakuten Symphony serves on the board of the Open RAN Policy Coalition.

¹¹ *Comments of the Open RAN Policy Coalition*, NTIA Docket No. 221202-0260 (Jan. 27, 2023).

- Entities that are best positioned to advance the goals of the WIF and continue to make significant contributions to the technological advancement of the United States.
- The global nature of the supply chain and current strengths and weaknesses of U.S. manufacturing in the telecommunications sector.
- Prioritizing measureable deployments and global adoption rates.

The Wireless Innovation Fund is positioned to be the most impactful opportunity created by the U.S. Government in its mission to lead collaborative global engagement and public-private partnerships in the advancement of Open RAN. Rakuten Symphony was honored to support several U.S.-led initiatives, such as Digital Connectivity and Cybersecurity Partnership workshops, USAID’s launch of the Asia Open RAN Academy and trade missions with the Open RAN Policy Coalition. Rakuten Symphony was also a participant at the Track 1.5 Open RAN Dialogue and deeply believes in its mission to better coordinate the four Quadrilateral Security Dialogue countries.¹² The strength of these four nations sends a clear global signal about the importance of vendor diversity and the commitment to deployment.

Similarly, major intergovernmental partnerships, such as the Group of Seven (“G7”), the U.S.-Japan Security Consultative Committee (“2+2”), the Indo-Pacific Economic Framework for Prosperity, and other multi-lateral and bi-lateral conversations have greatly impacted the education and adoption of Open RAN. By continuing to collaborate, the U.S. Government can inspire like-minded governments to provide similar assistance programs to help advance mutual telecommunications goals.

¹² See “Critical & Emerging Technologies,” *Quad Joint Leaders’ Statement*, The White House, available at <https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/24/quad-joint-leaders-statement/> (May 24, 2022).

VII. Conclusion

Rakuten Symphony commends NTIA for its continued global leadership on Open RAN. We appreciate the opportunity to comment on the implementation of the Wireless Innovation Fund. As Open RAN pioneers, we strongly support this program and its potential to drive innovation and disruption in the mobile industry.

Respectfully submitted,

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