May 28, 2021

Submitted via ECFS

Marlene H. Dortch
Federal Communications Commission
45 L Street NE
Washington, D.C., 20554

> **Re: Reply Comments of the Open RAN Policy Coalition on *Promoting the Deployment of 5G Open Radio Access Networks*, GN Docket No. 21-63.**

Dear Ms. Dortch,

The Open RAN Policy Coalition ("ORPC" or "Coalition")[1] appreciates the opportunity to provide additional input to the Federal Communications Commission ("Commission") on its Notice of Inquiry ("NOI") *Promoting the Deployment of 5G Open Radio Access Networks*.

Initial comments in this landmark proceeding provide a robust foundational record regarding the growing Open RAN market, show widespread consensus about the potential public benefits Open RAN can produce, and coalescence around several key steps the Commission and other policymakers can take to support these outcomes.

Commenters also express consensus that policies supporting industry innovation and carrier choice – not government mandates or legal preferences – will enable the market to realize the benefits of Open RAN.[2] Commenters describe active and diverse engagement in industry organizations that are driving standardization, testing, and other real-world advancement toward open and interoperable interfaces in the RAN.[3]

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[1] *See* https://www.openranpolicy.org/. As of this filing, the Coalition includes 60 members, including: Airspan, Altiostar, American Tower, Analog Devices, Arm, AT&T, AWS, Benetel, Bharti Airtel, Broadcom, Ciena, Cisco, Cohere Technologies, CommScope, Crown Castle, DeepSig, Dell Technologies, Deutsche Telekom, DISH Network, Facebook, Fujitsu, GigaTera Communications, Google, Hewlett Packard Enterprise, IBM, Inseego, Intel, JMA Wireless, Juniper Networks, Ligado Networks, Marvell, Mavenir, Microsoft, NEC Corporation, NewEdge Signal Solutions, Nokia, NTT, Nvidia, Oracle, Palo Alto Networks, Pivotal Commware, Qualcomm, Quanta Cloud Technology, Radisys, Rakuten Mobile, Reliance Jio, Rift, Robin, Samsung Electronics America, STL Tech, Telefónica, Texas Instruments, U.S. Cellular, US Ignite, Verizon, VMWare, Vodafone, World Wide Technology, XCOM-Labs, and Xilinx..

[2] In the record, commenters refer to a variety of terms, standards, and definitions to signify the concept of open and interoperable radio access networks. As in ORPC's opening round comments, for the purpose of clarity, herein "Open RAN" refers to networks that are compliant with O-RAN Alliance specifications. See https://www.o-ran.org/specifications.

[3] *See* Comments of AT&T, GN Docket No. 21-63, at 8 (filed Apr. 28, 2021) ("AT&T Comments"); Comments of CableLabs and NCTA – The Internet & Television Association, GN Docket No. 21-63, at 13-16 (filed Apr. 28,

Below we provide a distillation of the record on these and other points in the record that support the Coalition's advocacy for policies that advance Open RAN.

I. The Record Illustrates an Inflection Point of Increasing Open RAN Offerings and Deployments.

Comments across a diverse set of organizations in this record describe the promising state of the Open RAN market, noting significant technical progress and initial deployments in recent years. Commenters are clear that common commercial, global standards provide the foundation for growth of the Open RAN ecosystem and to ensuring network performance, scalability, and interoperability. Industry efforts to standardize use cases and coordinate Open RAN development in groups like the O-RAN Alliance, the Telecom Infra Project, OpenRAN project group, Open Network Automation Platform, and the Open Networking Foundation, are paving the way for increased Open RAN deployment across a wide array of network needs.[4]

In particular and as numerous commenters note, the O-RAN Alliance has made great progress by publishing specifications for Open Fronthaul.[5] The Open Fronthaul specification, which defines the interface between the Radio Unit (RU) and Distributed Unit (DU), provides a

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2021) ("CableLabs/NCTA Comments"); Comments of Competitive Carriers Association, GN Docket No. 21-63, at 2, 5-6 (filed Apr. 28, 2021) ("CCA Comments"); Comments of CommScope, Inc., GN Docket No. 21-63, at 8 (filed Apr. 28, 2021) ("CommScope Comments"); Comments of CTIA, GN Docket No. 21-63, at 2, 8 (filed Apr. 28, 2021) ("CTIA Comments"); Comments of Ericsson, GN Docket No. 21-63, at 1, 4, 9-10, 31-32 (filed Apr. 28, 2021) ("Ericsson Comments"); Comments of Google LLC, GN Docket No. 21-63, at 7 (filed Apr. 28, 2021) ("Google Comments"); Notice of Inquiry Comments of Intel Corporation, GN Docket No. 21-63, at 5-6 (filed Apr. 28, 2021) ("Intel Comments"); Comments of ITI (The Information Technology Industry Council), GN Docket No. 21-63, at 2, 10 (filed Apr. 28, 2021) ("ITI Comments"); Comments of Juniper Networks, GN Docket No. 21-63, at 8, 10 (filed Apr. 28, 2021) ("Juniper Comments"); Comments of Nokia, GN Docket No. 21-63, at 7-8 (filed Apr. 28, 2021) ("Nokia Comments"); Comments of the Open RAN Policy Coalition, GN Docket No. 21-63, at 32-33 (filed Apr. 28, 2021) ("ORPC Comments"); Comments of Samsung Electronics America, Inc., GN Docket No. 21-63, at 4 (filed Apr. 28, 2021) ("Samsung Comments"); Comments of the Telecommunications Industry Association, GN Docket No. 21-63, at 8 (filed Apr. 28, 2021) ("TIA Comments"); Comments of the Telecom Infra Project, GN Docket No. 21-63, at 29 (filed Apr. 28, 2021) ("TIP Comments"); Comments of T-Mobile USA, Inc., GN Docket No. 21-63, at 4-5, 9 (filed Apr. 28, 2021) ("T-Mobile Comments"); Comments of The U.S Chamber of Commerce, GN Docket No. 21-63, at 2 (filed Apr. 28, 2021) ("US Chamber Comments"); Comments of Verizon, GN Docket No. 21-63, at 9 (filed Apr. 28, 2021) ("Verizon Comments").

[4] *See* Comments of 5G Americas, GN Docket No. 21-63, at 2 (filed Apr. 28, 2021) ("5G Americas Comments"); Comments of AirHop Communications, Inc., GN Docket No. 21-63, at 3 (filed Apr. 28, 2021) ("AirHop Comments"); CTIA Comments at 3-5; Comments of Fujitsu Network Communications, Inc., GN Docket No. 21-63, at 7 (filed Apr. 28, 2021) ("Fujitsu Comments"); Comments of IBM, GN Docket No. 21-63, at 2 (filed Apr. 28, 2021) ("IBM Comments"); Comments of IEEE Standards Association, GN Docket No. 21-63, at 2 (filed Apr. 28, 2021) ("IEEE Comments"); Intel Comments at 2; CableLabs/NCTA Comments at 3-6, 10; Nokia Comments at 3; TIP Comments at 14.

[5] *See* 5G Americas Comments at 9; Intel Comments at 2; Nokia Comments at 7; ORPC Comments at 9.

standard mechanism for interoperability at the seam between open and proprietary parts of the network.[6] Carriers are deploying and exploring products using this specification in their own networks as they work to incorporate Open RAN.[7] As more vendors begin using this specification and engage with network owners and operators to demonstrate diverse deployments, Open RAN applicability will become increasingly ubiquitous. As ORPC noted in its initial comments, the O-RAN Alliance published its first release of a Minimum Viable Plan (MVP) in March 2021, which compiles published open specifications across various aspects of the RAN (including fronthaul, transport, hardware, stack, cloud, etc.) and will be updated with additional features and functionalities based on the deployment priorities of network operators.[8] The MVP paves a glide path to increasing Open RAN deployment, which will accelerate with additional iterations.

As illustrated by examples of offerings, key milestones, and prospective targets provided in ORPC's initial comments, Coalition members stand among the network owners, operators, and vendors at the forefront of this innovation and from every segment of the ecosystem.[9] Other commenters also provide valuable descriptions of specific vendor and operator Open RAN offerings and development/deployment activities that speak to varying states of Open RAN readiness.[10] The Coalition is developing a comprehensive living tracker of ORPC members'

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[6] As Qualcomm describes, "open fronthaul is designed to provide a standard mechanism where CPRI [Common Public Radio Interface] vendor-proprietary systems are currently used and has the potential to interwork with this legacy equipment," Comments of Qualcomm Incorporated, GN Docket No. 21-63, at 4 (filed Apr. 28, 2021) ("Qualcomm Comments"). *See also* CTIA Comments at 6 (noting that Open RAN will have to be capable of being integrated into national providers' existing wireless infrastructure and "[t]his is why ongoing work in the O-RAN Alliance on an open front haul interface between radios (RU) and the associated hardware (DU) is so critical.").

[7] ORPC Comments at 10-17. *See also* AT&T Comments at 6 (noting that AT&T has initiated pilot projects with multiple suppliers including CommScope, Nokia, Intel, and Samsung).

[8] ORPC Comments at 9-10.

[9] ORPC Comments at 10-17.

[10] *See e.g.* 5G Americas Comments at 26; AirHop Comments at 3; AT&T Comments at 3, 6-7; Comments of Ciena Corporation, GN Docket No. 21-63, at 1-2, 6 (filed Apr. 28, 2021) ("Ciena Comments"); CommScope Comments at 4-6; CTIA Comments at 5-7; Comments of DISH Network Corporation, GN Docket No. 21-63, at 2, 5 (filed Apr. 28, 2021) ("DISH Comments"); Ericsson Comments at 6-8; Juniper Comments at 3; Comments of Mavenir Systems, Inc., GN Docket No. 21-63, at 9, 15 (filed Apr. 28, 2021) ("Mavenir Comments"); CableLabs/NCTA Comments at 3-6; Nokia Comments at 1-2; Comments of The NTT Group, GN Docket No. 21-63, at 2, 4-9 (filed Apr. 28, 2021) ("NTT Comments"); Comments of Palo Alto Networks, GN Docket No. 21-63, at 1, 4 (filed Apr. 28, 2021) ("Palo Alto Networks Comments"); Qualcomm Comments at 6; Comments of Rakuten Mobile USA, LLC, GN Docket No. 21-63, at 4-5, 8-10 (filed Apr. 28, 2021) ("Rakuten Comments"); Comments of Red Hat, Inc., GN Docket No. 21-63, at 2-3 (filed Apr. 28, 2021) ("Red Hat Comments"); Samsung Comments at 2-3; TIP Comments at 36-42; Verizon Comments at 3-4; Comments of the Institute of the Wireless Internet of Things, GN Docket No. 21-63, at 4 (filed Apr. 28, 2021) ("WIoT Comments"); Comments of Xilinx, Inc., GN Docket No. 21-63, at 5 (filed Apr. 28, 2021) ("Xilinx Comments").

public offerings, deployments, and demonstrations.[11]

II. Commenters Broadly Agree That Open RAN Can Produce Numerous Public Benefits.

Vendor Diversity and Competition. The record unambiguously confirms the Coalition's contention that Open RAN enables increased and more varied vendor participation in the marketplace. As a result, Open RAN continues to expand the market of suppliers, lower the barrier to entry for new participants (including smaller companies), prevent vendor lock-in, and reduce dependence on specific vendors, which will support U.S. leadership in 5G and beyond.[12] The diversity of the ORPC's membership – representing network operators, equipment providers, hardware, software, cloud services, and semiconductor companies – itself reinforces the Coalition's contention.

Innovation. Likewise, the record supports the Coalition's position that Open RAN is catalyzing innovation and creating more options for network architecture and configuration.[13]

Deployment. Several commenters note that this increasing competition, innovation, and network vendor diversity can also create a virtuous cycle for reducing deployment and operation costs – and can accelerate the ability to build out 5G networks (including in rural and low-income communities).[14]

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[11] The ORPC will provide this tracking document to the Commission in preparation for the recently-announced Open RAN Solutions Showcase and members look forward to participating in the event. *See* "Acting Chairwoman Rosenworcel Announces June 29 Showcase for Open Radio Access Network Solutions," Press Release (May 27, 2021), https://docs.fcc.gov/public/attachments/DOC-372815A1.pdf.

[12] *See* Comments of Airspan Networks, GN Docket No. 21-63, at 4 (filed Apr. 28, 2021) ("Airspan Comments"); Comments of Arm, Inc., GN Docket No. 21-63, at 4-5 (filed Apr. 28, 2021) ("Arm Comments"); AT&T Comments at 8; CTIA Comments at 9; Comments of Dell Technologies, GN Docket No. 21-63, at 2, 5-6 (filed Apr. 28, 2021) ("Dell Comments"); DISH Comments at 2-4; Fujitsu Comments at 6, 12; Comments of Hewlett Packard Enterprise, GN Docket No. 21-63, at 3 (filed Apr. 28, 2021) ("HPE Comments"); IBM Comments at 3; ITI Comments at 4-5; Mavenir Comments at 24-25; Comments of Microsoft Corporation, GN Docket No. 21-63, at 11 (filed Apr. 28, 2021) ("Microsoft Comments"); CableLabs/NCTA Comments at 5; Comments of NEC Corporation of America, GN Docket No. 21-63, at 3-4 (filed Apr. 28, 2021) ("NEC Comments"); Nokia Comments at 5, 6-7; NTT Comments at 9; ORPC Comments at 19-21; Rakuten Comments at 2-3; Samsung Comments at 2; Comments of Telefonica, GN Docket No. 21-63, at 4 (filed Apr. 28, 2021) ("Telefonica Comments"); TIA Comments at 2; TIP Comments at 15-16; Comments of The Taxpayer Protection Alliance, GN Docket No. 21-63, at 2 (filed Apr. 28, 2021) ("TPA Comments"); U.S. Chamber Comments at 4; Verizon Comments at 11; Comments of VMware Inc., GN Docket No. 21-63, at 6-7 (filed Apr. 28, 2021) ("VMware Comments"); Comments of Wavelabs Technologies, GN Docket No. 21-63, at 4 (filed Apr. 28, 2021) ("Wavelabs Comments").

[13] *See* 5G Americas Comments at 27; AirHop Comments at 3-4; Ciena Comments at 2; Google Comments at 3-4; HPE Comments at 4, 7; CableLabs/NCTA Comments at 5; Microsoft Comments at 8.

[14] *See* Airspan Comments at 4; Fujitsu Comments at 6; Mavenir Comments at 21; NTT Comments at 5-6; ORPC Comments at 21-24; TPA Comments at 2-3; WIoT Comments at 1.

Technological Improvements. Several commenters note that Open RAN also provides or otherwise leverages technological improvements, such as use of the RAN Intelligent Controller ("RIC"). In addition, it complements efforts to replace much of the time-consuming and manual work of maintaining, upgrading, and optimizing networks with light-touch, centrally managed, and automated computing processes. Open RAN can also increase network efficiency and performance when compared to legacy wireless architectures.[15] Virtualization and cloud approaches are well utilized in other telecommunications applications and platforms, and these efficiencies are poised to play an even more significant role in Open RAN implementations, transformation, and innovation.[16]

Network Security. Finally, the record affirms that Open RAN is complementary part of 5G's security enhancements. Consistent with the Coalition's position, commenters broadly agree that Open RAN can build upon the security enhancements already enabled by 5G by allowing the operator more control over the security of the network and ultimately enhancing the operational security of their network.[17] Open networks can also speed the complete automation of network management, increase the speed with which operators can install software and operating system security patches, and distribute security analytics throughout the network.[18] Consistent with this goal, and recognizing that network security is and will always be an ongoing process for ever-improving security, O-RAN Alliance continues important work to further advance specifications for security.[19]

III. The Transition to Open RAN Includes Managing Challenges Similar to Those in Past Evolutions of ICT Networks.

While working to achieve these benefits, participants in the Open RAN ecosystem are addressing the evolving nature of system integration in the transition to Open RAN and the role that systems integrators will play. As the Commission recognizes in the NOI and as commenters

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[15] *See* 5G Americas Comments at 11; Airspan Comments at 3; Juniper Comments at 4-5; ORPC Comments at 21-23; Rakuten Comments at 4-5.

[16] *See e.g.* 5G Americas at 9; Google at 3-9; Microsoft at 7-18.

[17] *See* AT&T Comments at 9-11; CTIA Comments at 9-11; Dell Comments at 5; DISH Comments at 3; Fujitsu Comments at 6-8; HPE Comments at 9; Mavenir Comments at 20; Microsoft Comments at 13-20; ORPC Comments at 24-26; Palo Alto Networks Comments at 3-4; Qualcomm Comments at 10; Rakuten Comments at 6-8; Comments of the Rural Wireless Association, GN Docket No. 21-63, at 2 (filed Apr. 28, 2021); Telefonica Comments at 3; TIP Comments at 20-22; U.S. Chamber Comments at 3-4; VMware Comments at 8.

[18] *Id.*

[19] *See also* Amy Zwarico (AT&T), Sébastien Jeux (Orange), et al., The O-RAN ALLIANCE Security Task Group Tackles Security Challenges on All O-RAN Interfaces and Components (Oct. 20, 2020), https://www.o-ran.org/blog/2020/10/24/the-o-ran-alliance-security-task-group-tackles-security-challenges-on-all-o-ran-interfaces-and-components; *see also* Ericsson Comments at 24-27.

discuss, transitioning to Open RAN will in many cases require systems integrators (or other entities performing similar functions) to help navigate more diverse network environments.[20] However, communications technology veterans recognize that the considerations associated with the need for systems integrators are not prohibitive nor especially challenging, but rather reflect similar challenges associated with previous evolutions toward interoperability.[21] Providers are meeting these challenges.[22] And commenters note that the U.S. marketplace already boasts numerous providers—including traditional systems integrators and entities using alternative approaches—that can provide integration in the Open RAN context.[23]

IV.   **Building on Cloud Capabilities, Artificial Intelligence and Machine Learning Can Play a Significant Role in Open RAN Deployments.**

Commenters also recognize that artificial intelligence (AI) and machine learning (ML) can play a significant role in facilitating Open RAN deployment and improving network function over the long-term. Consistent with the larger evolution toward next generation networks that incorporate virtualization, cloudification, automation, etc., AI and ML can enhance network management and function. Numerous commenters assert that AI- and ML-based radio control will increase spectral efficiency and network resiliency, improve security, and facilitate network interoperability.[24] Some commenters suggest that leveraging AI and ML to manage Open RAN networks can reduce initial deployments costs and operating expenditures.[25]

Expanding cloud capabilities are fundamental to leveraging AI and ML.[26] By recognizing cloud capabilities as essential to Open RAN, the U.S. has an opportunity to expand and grow the ecosystem of developers, security practices, standards, and innovations, while also making significant advancements in AI and ML.

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[20] *See* CommScope Comments at 7-8; Ericsson Comments at 22-23; Comments of The Marconi Society, GN Docket No. 21-63, at 1 (filed Apr. 28, 2021); Mavenir Comments at 23; Qualcomm Comments at 5; Rakuten Comments at 10.

[21] *See* CommScope Comments at 7-8; Dell Comments at 7; Fujitsu Comments at 6, 9-10; Juniper Comments at 10; Mavenir Comments at 25; OPRC Comments at 28-29; TIP Comments at 25-27.

[22] *Id.*

[23] *See* Dell Comments at 7; IBM Comments at 4; Comments of Open Networking Foundation, GN Docket No. 21-63, at 8 (filed Apr. 28, 2021); OPRC Comments at 28-29; TIP Comments at 25-26; Xilinx Comments at 6.

[24] *See* 5G Americas Comments at 33-43; AT&T Comments at 12; Fujitsu Comments at 10; Google Comments at 4; HPE Comments at 5-6; Microsoft Comments at 9; Palo Alto Networks Comments at 4; Rakuten Comments at 7-8; Telefonica Comments at 2-3; TPA Comments at 2; Verizon Comments at 16.

[25] *See* Fujitsu Comments at 10; Google Comments at 4.

[26] *See e.g.* 5G Americas at 34; Google 4; Microsoft at 15.

V.   The Record Supports Several Key Actions the Commission and Other Policymakers Can Take to Support Open RAN.

Policymakers will play an important role in ensuring the successful development and deployment of Open RAN.[27] To that end, the record broadly recommends Commission and U.S. government policy to support industry advances in Open RAN by:

- **Promoting Operator Choice and Vendor Innovation.** As discussed above, the record clearly shows that industry is driving rapid acceleration of Open RAN offerings and deployments, including significant technical progress and initial deployments in recent years.[28] Commenters overwhelmingly support policies that promote operator choice and vendor choice without government mandates or legal preferences that dictate how and when carriers build out their networks.[29] The record indicates that government mandates or legal preferences would impede industry's accelerating progress toward deploying Open RAN to meet the individual needs of network owners and operators.[30] The Commission should continue to allow the market to drive awareness and adoption of Open RAN going forward.

- **Promoting 5G Deployment and Identifying Regulatory Barriers.** As 5G deployments occur more broadly, so too do opportunities for carriers to implement Open RAN or take intermediate steps towards Open RAN.[31] Commenters urge the Commission to focus on accelerating 5G deployment as a driver of Open RAN deployment and innovation with new use cases,[32] and continue to advance a regulatory framework that supports more 5G deployment.[33]

- **Promoting Diversity Among Trusted Vendors in the Global Marketplace.** Commenters agree that U.S. policy should not focus narrowly on U.S.-headquartered

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[27] *See* ORPC Comments at 32.

[28] *See* Section I above.

[29] *See* AT&T Comments at 8; CableLabs/NCTA Comments at 13-16; CCA Comments at 2, 5-6; CommScope Comments at 8; CTIA Comments at 2, 8; Ericsson Comments at 1, 4, 9-10, 31-32; Google Comments at 7; Intel Comments at 5-6; ITI Comments at 2, 10; Juniper Comments at 8; Nokia Comments at 7-8, 10; ORPC Comments at 32-33; Samsung Comments at 4; TIA Comments at 8; TIP Comments at 29; T-Mobile Comments at 4-5, 9; U.S. Chamber Comments at 2; Verizon Comments at 9.

[30] *See* CTIA Comments at 8.

[31] *See* CableLabs/NCTA Comments at 2; ORPC Comments at 33; Qualcomm Comments at 12.

[32] *See* Ciena Comments at 7-8; CTIA Comments at 2, 12; Intel Comments at 5-6; ORPC Comments at 33-34; Rakuten Comments at 17.

[33] *See* Rakuten Comments at 17; CTIA Comments at 13.

companies or the U.S. market alone.[34] Instead, policymakers should promote a diverse, competitive ecosystem of suppliers headquartered in the U.S. and partner countries that collectively have the capacity to serve the growing needs of U.S. carriers and the 5G market.[35] The Commission and U.S. government agencies should leverage formal and informal association with like-minded, international partners to take steps that advance Open RAN's adoption.[36] Congress should also work to fully fund Multilateral Telecommunications Security Fund, which was created by the USA Telecom Act and passed through the National Defense Authorization Act for the Fiscal Year 2021.[37]

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- **Collaborating with Other Federal Agencies.** Multiple commenters urge the Commission to coordinate and partner with other agencies to maximize the impact of programs like the National Telecommunications and Information Administration (NTIA) Public Wireless Innovation Fund, the National Science Foundation's Platforms for Advanced Wireless Research, and work with others such as the Department of Defense and Department of State on, for example, advanced Open RAN technology testbeds, demonstration projects, and plugfests.[38] ORPC agrees that previous 5G reports and recommendations from CSRIC provide a strong foundation for interagency collaboration on Open RAN.[39] Further, federal procurement may provide valuable opportunities for government agencies to promote Open RAN deployment.[40]

- **Using the Universal Service Fund "Rip-and-Replace" Proceeding for Open RAN Deployment and Advancement.** Multiple commenters note that the "Rip-and-Replace" proceeding, when paired with sufficient Congressional appropriation,

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[34] *See* AT&T Comments at 16; CTIA Comments at 2, 13-14; DISH Comments at 4; Ericsson Comments at 5, 8; ITI Comments at 10; ORPC Comments at 35; Samsung Comments at 5; U.S. Chamber Comments at 5.

[35] *Id*.

[36] Commenters cite partnerships like the Quad, the G7, and the Prague Proposals among these important partnerships. *See* AT&T Comments at 16; CTIA Comments at 13-14; Dell Comments at 9-10; Microsoft Comments at 22-26; NEC Comments at 5; NTT Comments at 11-12; ORPC Comments at 35-36; Rakuten Comments at 18-20.

[37] *See* CTIA Comments at 13-14; DISH Comments at 8; NEC Comments at 5; ORPC Comments at 36; Rakuten Comments at 15-16.

[38] *See* AT&T Comments at 13-14; CommScope Comments at 9; CTIA Comments at 15-16; Dell Comments at 9; Google Comments at 7; IBM Comments at 5; ITI Comments at 11; Mavenir Comments at 11-12; NEC Comments at 5; Nokia Comments at 2-3; ORPC Comments at 37-39; Rakuten Comments at 15, 17-18; Samsung Comments at 5; TIP Comments at 35-36; Verizon Comments at 8.

[39] *See* CTIA Comments at 15-16.

[40] *See* Ciena Comments at 6-7; Intel Comments at 7; Juniper Comments at 9.

provides an important opportunity for the Commission to promote Open RAN.[41] Commenters overwhelmingly urge the Commission not to mandate or pressure operators in their replacement choices,[42] but rather to use the proceeding to enable operators to make informed decisions based on clear timelines, which will help those considering Open RAN when replacing their networks.[43] The Commission should help build awareness and facilitate coordination and information exchange regarding best practices among carriers considering how to leverage Open RAN in their own networks.[44] By partnering with other agencies to leverage the Rip-and-Replace process and related funding to inform advanced Open RAN technology testbeds, demonstration projects, and pilot projects, the Commission can help accelerate and enhance network upgrades.[45]

- **Taking Steps to Build Operator Confidence**. Commenters agree that the Commission and other policymakers should continue to support efforts to bolster operators' confidence in Open RAN solutions (including in the Rip-and-Replace proceeding).[46] Continued industry collaboration to standardize enhancements across the network and build out real world demonstrations across a variety of use cases will go far in this regard. These efforts may include support from the Commission through activities such as (1) conducting outreach to smaller operators to build education and awareness; (2) providing technical assistance to federal Open RAN integration; and (3) providing visibility to successful Open RAN case studies.[47]

- **Leveraging CSRIC to Further Open RAN Advances in Security.** The Commission can help bolster secure and reliable deployment of Open RAN by continuing to encourage progress throughout the Open RAN ecosystem.[48] The

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[41] *See* Fujitsu Comments at 12; Intel Comments at 6-7; ORPC Comments at 39; Rakuten Comments at 12-13.

[42] *See* CCA Comments at 3; Nokia Comments at 15; ORPC Comments at 32; TIA Comments at 7-8; U.S. Chamber Comments at 2-3.

[43] *See* ORPC Comments at 39.

[44] *See* CCA Comments at 4-5; CTIA Comments at 2, 14-15; Dell Comments at 8; Google Comments at 8-9; IBM Comments at 5; ITI Comments at 9; Juniper Comments at 8; ORPC Comments at 41; VMware Comments at 9-10.

[45] *See* NEC Comments at 5; ORPC Comments at 40.

[46] *See* IBM Comments at 2; TIP Comments at 32.

[47] *See* TIP Comments at 32;

[48] *See* Qualcomm Comments at 1.

Commission's Cyber Security, Reliability, and Interoperability Council (CSRIC) provides an expert forum in which to do so.[49]

- **Facilitating Additional Testing, Research and Development, Demonstrations and Standardization.** Alongside other federal agencies and industry partners, the Commission should also encourage the creation, funding and coordination of advanced Open RAN technology testbeds, demonstration projects and related initiatives that focus on applied use cases.[50] More broadly, the U.S. government should explore additional incentives such as tax-free grants or tax credits for Open RAN research, development, and deployment.[51] And the U.S. government should support strong industry engagement in the standards development process.[52]

The Coalition appreciates the Commission's work on this important issue, particularly in convening stakeholders to develop a record that will help the Open RAN community continue to build common understanding around this promising evolution in network architecture. We applaud the Commission's increasing partnership with other federal agencies in this effort as well and look forward to continued work with the Commission to promote secure, reliable, open, and interoperable architectures for communications networks going forward.

Sincerely,
/*signed*/
Diane Rinaldo
Executive Director

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[49] *See* AT&T Comments at 13; CCA Comments at 5, Microsoft Comments at 17-18, 22; Palo Alto Networks Comments at 2; Qualcomm Comments at 1.

[50] *See* Arm Comments at 7-8; CCA Comments at 4; CommScope Comments at 9-10; Dell Comments at 8; Ericsson Comments at 4, 32-34; Google Comments at 8; IBM Comments at 4-5; Intel Comments at 6; ITI Comments at 11; Juniper at 10; Microsoft at 21-22, 24; NCTA/CableLabs at 15; Nokia at 2, 9, 13; NTT at 11; ORPC at 37; Rakuten at 14; Red Hat Comments at 9; Qualcomm Comments at 7; TIP Comments at 34; Verizon Comments at 4; WIot Comments at 8; Xilinx Comments at 8. Specifically, the Commission should support, and Congress should fund, the Public Wireless Supply Chain Innovation Fund. *See* CommScope Comments at 10-11; CTIA Comments at 16; DISH Comments at 8; CableLabs/NCTA Comments at 15; Rakuten Comments at 14.

[51] *See* AT&T Comments at 16; Ciena Comments at 6-7; Dell Comments at 8; ITI Comments at 10; T-Mobile Comments at 8; U.S. Chamber Comments at 6.

[52] *See* AT&T Comments at 15; Ericsson Comments at 34; ITI Comments at 3; Mavenir Comments at 11-12; Telefonica Comments at 5-6; Red Hat Comments at 9; Juniper Comments at 10-11.