

Before the
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
Washington, DC 20230

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| In the Matter of |) | |
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| Input on Proposals and Positions for the 2020 |) | Docket No. 200504-0126 |
| World Telecommunication Standardization |) | RIN-0660-XC04 |
| Assembly |) | |

COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

The Telecommunications Industry Association (TIA) appreciates the opportunity to provide input from industry regarding U.S. government negotiating objectives for the 2020 World Telecommunication Standardization Assembly (WTSA-2020). As a U.S.-based, ANSI-accredited standards development organization for the telecommunications sector and as an advocacy organization for trusted manufacturers and suppliers of telecommunications networks, TIA understands how important it is that the United States engage at the international standards events such as WTSA-2020. To that end, the U.S. should continue to advocate for the mission outlined in the Administration’s 2017 National Security Strategy – one focused on “open, interoperable communications, with minimal barriers to the global exchange of information and services.” Similarly, TIA supports NTIA’s objectives to advance the multistakeholder approach to internet policy, restructure ITU-T to make it more effective, improve ITU-T processes and structures, and increase the influence of the United States in the organization.

In support of NTIA’s stated objectives, TIA has identified the “New IP” proposal, outlined in ITU-T TSAG contribution T17-TSAG-C83 presented at the September 2019 TSAG meeting, as duplicative of existing efforts, harmful to industry, and contrary to the interests of the

United States.¹ Other proposals have been made in various ITU study groups that are directly related to this "New IP" effort, and link it to the research work of Focus Group Technologies for Network 2030 (FG NET-2030), which was created in July 2018 by Study Group 13.² The New IP proposals make a series of arguments advocating for a new suite of networking protocols following a top-down design, based around alleged shortcomings of the existing TCP/IP-based networks. The new proposal, according to proponents Huawei and the Chinese government, promises to provide better support for heterogeneous networks that more efficiently combine satellite and terrestrial signals, deliver better performance, increase security, and support futuristic applications such as "holographic-type" communication.

TIA believes that NTIA and the U.S. government should oppose the New IP proposal and related initiatives for the following reasons:

1. New IP duplicates work being done in the IETF and other standards bodies
2. New IP poses practical and technical challenges
3. New IP works against the multi-stakeholder approach to the Internet

To the extent that work being done to address substantive technical concerns identified by the authors of the New IP proposal, TIA believes that it should be conducted in multi-stakeholder, inclusive forums with experience developing internet protocols such as the IETF. Additionally, proposals to reform or change IP protocols should avoid reproducing monolithic, top-down architectures like those advocated for in the New IP proposal.

¹ Int'l Telecomm. Union [ITU], "New IP, Shaping Future Network": Propose to Initiate the Discussion of Strategy Transformation for ITU-T, TSAG-C83 (Sep. 10, 2019), <https://www.itu.int/md/T17-TSAG-C-0083>

² Int'l Telecomm. Union [ITU], *Network 2030: A Blueprint of Technology, Applications and Market Drivers Towards the Year 2030 and Beyond*, White Paper, FG-NET-2030 (2019), https://www.itu.int/en/ITU-T/focusgroups/net2030/Documents/White_Paper.pdf

New IP duplicates work being done in the IETF and other standards groups

While some elements of the New IP proposal are fundamentally flawed and should not be pursued in the context of international standards development efforts, other elements of the proposal do have some merit and in fact are already being pursued in other standards development contexts. For example, the issue of integrating satellite and IP terrestrial networks is not new and has been addressed as far back as 1999 by the IETF in RFC 2488, which describes TCP over satellite channels.³ IETF continues to have a working group focused on moving this technology forward through the application of QUIC network protocols for satellite communications which touch specifically on the question of a non-TCP protocol's integration with satellite communications.⁴

The New IP proposal laudably focuses on a need to reduce latency. From a standards perspective, this work is ongoing at the IETF through initiatives such as Transport Layer Security (TLS); QUIC; Deterministic Networking (DetNet); and Low Latency, Low Loss, Scalable Throughput (L4S), among others.⁵ 3GPP continues to develop Ultra-Reliable Low-Latency Communication (URLLC) standards for 5G,⁶ and is collaborating with the 5G Alliance

³ M. Allman, D. Glover & L. Sanchez. *Enhancing TCP Over Satellite Channels Using Standard Mechanisms*. IETF RFC 2488 (1999), <https://tools.ietf.org/html/rfc2488>

⁴ *Response to "Liaison Statement on New IP, Shaping Future Network"* IETF: DATATRACKER (Mar. 30, 2020), <https://datatracker.ietf.org/liaison/1677/>

⁵ *Id.*

⁶ *See Study on Physical Layer Enhancements for NR Ultra-Reliable and Low Latency Case (URLLC)*, Technical Specification, 3GPP (2018), <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3498> (hereinafter [3GPP Specification]); *see also* Alan Weissberger, *3GPP Release 16 Update: 5G Phase 2 (including URLLC) to be Completed in June 2020; Mission Critical Apps Extended*, IEEE (Oct. 6, 2019), <https://techblog.comsoc.org/2019/10/06/3gpp-release-16-update-5g-phase-2-including-urllc-to-be-completed-in-june-2020/>

for Connected Industries and Automation (5G-ACIA) with respect to the needs of wireless industrial automation and control systems.⁷

On a more fundamental level, however, the primary issue in terms of reducing latency is not with flaws with existing IP protocols. Rather, it is an infrastructure issue. Consumers need more base stations, more fiber, and more edge data centers – not more duplicative standards.

New IP poses practical and technical challenges

New IP casts aside the existing Internet architecture – the product of billions of dollars in investment by companies around the world – in favor a new approach with uncertain technical merits. Many of the challenges identified in the paper have already been effectively tackled in existing, widely-deployed protocols, for example:

- *Universal encapsulation*: Encapsulation technologies such as Geneve, GRE, L2TPv3, VXLAN are already extensible and deployed across thousands of networks worldwide. It is unclear why these technologies, or future ones, are insufficient for future networking use cases.⁸
- *Traffic steering and metadata carrying*: Segment routing provides many of these functions, and while still being finalized, is deployed across a number of large carrier networks.⁹
- *Multipath*: Multipath concerns session/identity preservation across multiple network providers. Yet technologies such as iOS/macOS, Linux, FreeBSD, and others have used Multipath TCP for some time. More recently, Hybrid ICN and MP-QUIC are also addressing this.¹⁰
- *Determinism*: Most prominently, IEEE 802.1 Time-Sensitive Networking standards have been designed to guarantee packet transport with bounded latency, low packet delay

⁷ *5G for Connected Industries and Automation*, White Paper, 5G ALLIANCE FOR CONNECTED INDUSTRIES AND AUTOMATION (2019), https://www.5g-acia.org/fileadmin/5G-ACIA/Publikationen/Whitepaper_5G_for_Connected_Industries_and_Automation/WP_5G_for_Connected_Industries_and_Automation_Download_19.03.19.pdf

⁸ *Encapsulation Techniques: Generic Network Virtualization Encapsulation, VXLAN Generic Protocol Extension, and Network Service Header*, White Paper, CISCO (2014), <https://www.cisco.com/c/en/us/solutions/collateral/data-center-virtualization/application-centric-infrastructure/white-paper-c11-733127.pdf>

⁹ See e.g., *News & Blog Entries*, SEGMENT ROUTING (2020), <https://www.segment-routing.net/news/>

¹⁰ Luca Muscariello, *Cisco Advances Open-Source Hybrid Information-Centric Networking for 5G*, Cisco (Feb. 19, 2019), <https://blogs.cisco.com/innovation/cisco-advances-open-source-hybrid-information-centric-networking-for-5g>

variation, and low packet loss on local and metro area networks. Applications such as audio, video, and entertainment production are already deploying technology based on these standards, In addition, the IETF currently is examining deterministic networking for layer 2 bridged and layer 3 networks, which when completed, will see these deployments expanding further.¹¹ As noted above, 3GPP continues its efforts to offer ultra-low latency capabilities.¹²

Given that the concerns raised by the New IP proposal are already addressed in existing efforts, the practical implications of amending the current Internet Protocol suite with non-interoperable protocols should be seriously considered. By introducing a separate and monolithic top-down architecture for the internet, the New IP proposal would be significantly disruptive. Everything from existing network operations to software, applications, and even the commerce enabled by existing TCP/IP would be impacted. In addition to significant direct costs needed to develop and deploy this new network protocol, replacing TCP/IP would necessitate new business and operational agreements between thousands of independent network operators. Quality of service aspects of the proposal would also complicate existing regulatory frameworks in areas such as licensing, competition policy, data protection, pricing, and universal service obligations.¹³

New IP imperils the multi-stakeholder approach to the internet

The New IP proposal as introduced in contribution T17- TSAG-C83 promises to create a “top-down design for the future network.”¹⁴ This inversion of the Internet from a bottom-up, connected network to a centrally administered, top-down one is antithetical to the multi-stakeholder approach that continues to facilitate and enhance innovation. In addition to putting

¹¹ See *Deterministic Networking (detnet)*, IETF: DATATRACKER (2020), <https://datatracker.ietf.org/wg/detnet/about/>

¹² See 3GPP Specification, *supra* note 6.

¹³ Hascall Sharp & Olaf Kolkman, *Discussion Paper: An Analysis of the “New IP” Proposal to the ITU-T*, INTERNET SOC’Y (2020), <https://www.internetsociety.org/resources/doc/2020/discussion-paper-an-analysis-of-the-new-ip-proposal-to-the-itu-t/>

¹⁴ Int’l Telecomm. Union [ITU], “*New IP, Shaping Future Network*”: *Propose to Initiate the Discussion of Strategy Transformation for ITU-T*, TSAG-C83 (Sep. 10, 2019), <http://prod-upp-image-read.ft.com/ec34d7aa-70e6-11ea-95fe-fcd274e920ca>

innovation at risk, the top-down design proposed in the New IP initiative stands in contrast to American values. As a forthcoming research report prepared by Oxford Information Labs to the North Atlantic Treaty Organization (NATO) notes, New IP will enable “fine-grained controls in the foundations of the network” through the implementation of Distributed Ledger Technologies (DLTs). In China and other authoritarian states, DLTs would likely be directly controlled by the government.¹⁵ The likely outcome of this would be a “more centralised, top-down control of the internet and potentially even its users, with implications on security and human rights.”¹⁶

Advocating for international standards

The New IP proposal aside, TIA supports continued and consistent U.S. government engagement with international standards development organizations including the ITU. This engagement is most effective when conducted in close cooperation with the private sector and with U.S. standards development organizations. TIA looks forward to partnering with NTIA, the Department of State, NIST, and other U.S. government stakeholders on standards issues of shared concern moving forward, and we encourage the further development of policies that facilitate maximum participation by U.S. entities in the development of global standards.

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¹⁵ Anna Gross & Madhumita Murgia, *China and Huawei Propose Reinvention of the Internet*, FIN. TIMES (Mar. 27, 2020), <https://www.ft.com/content/c78be2cf-a1a1-40b1-8ab7-904d7095e0f2>

¹⁶ Stacie Hoffman, Dominique Lazanski & Emily Taylor, *Standardising the Splinternet: How China’s technical standards could fragment the Internet*, OXFORD INFO. LABS (2020) (forthcoming).

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