June 25, 2020

Via E-Mail
Attn: Secure 5G RFC
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue
NW, Room 4725
Washington, DC 20230
secure5G@ntia.gov.

Re: EchoStar/Hughes Comments in Secure 5G Request for Comment
Docket No. 200521–0144

Dear Sir or Madam:

Hughes Network Systems, LLC and EchoStar Satellite Services, L.L.C. (collectively, EchoStar/Hughes), U.S.-headquartered sister companies,[1] hereby provide their comments in the Secure 5G RFC proceeding referenced above (hereinafter, RFC).[2] EchoStar/Hughes is a leader in satellite communications both as a provider of satellite communications as well as a U.S. manufacturer of satellite terrestrial infrastructure. Today, EchoStar/Hughes has over 1.4 million satellite broadband users in North America

EchoStar/Hughes has a long history of ensuring the security of its communications networks and equipment and therefore, fully supports the efforts of the Administration, the Department of Commerce (DOC) and the National Telecommunications and Information Administration (NTIA) in this area. EchoStar/Hughes as a global leader in satellite communications and has taken a leadership role in standards bodies, such as 3GPP on ensuring that satellite is a reliable and secure part of the 5G infrastructure. As the White House has recognized, satellite will be an important part of the 5G ecosystem. [3] Accordingly, EchoStar/Hughes appreciates the opportunity to share its views on the development and deployment of a secure, reliable global 5G ecosystem, how to improve U.S. leadership in 5G and beyond.

The roll out of 5G technologies and development of the 5G commercial ecosystem must rely on market-based principles; the same market-based principles that were critical in leading to the success

[1] Their parent company is the U.S.-based EchoStar Corporation (www.echostar.com).
[2] National Telecommunications and Information Administration, *The National Strategy to Secure 5G Implementation Plan*, Request for Comment, Docket No. 200521-0144. (rel. May 28, 2020).
[3] *Ensuring America Reaches its 5G Potential*, White House Office of Science and Technology Policy, 30 May 2019 https://www.whitehouse.gov/articles/ensuring-america-reaches-its-5g-potential/

of 3G and 4G in the United States as well as the explosion of global broadband and other advanced satellite services. To be successful in 5G and beyond leadership, the United States must abide by the following key principles in creating its policies and regulation:

1) Include the private sector as a stakeholder in the development of rules and policies governing 5G including security and trade;
2) Recognize importance of public-private partnerships and the use of best practices in achieving U.S. goals for and leadership in 5G, including security;
3) Take alight a light touch to regulation and eliminate unnecessary regulations and costs being imposed on US. industry;
4) Create transparent and predictable regulation;
5) Provide baseline requirements without dictating technological solutions:
6) Adopt technology neutral regulation in areas such as the allocation of scarce resources, including for spectrum allocation and funding mechanisms;
7) Adopt clear and stable rules governing trade including imports and exports; and
8) Ensure U.S. leadership and support of U.S. industry in international forums including standard bodies and the International Telecommunications Union.

Reliance on these key principles will ensure that the overall approach that the U.S. government takes toward ensuring U.S. leadership in and the security of 5G overall will best serve the interests of the United States.

The development of public-private partnerships (PPPs) are vital to the successful deployment and development of secure 5G in the United States and EchoStar/Hughes supports the U.S. government working through PPPs to foster and promote the research, development, testing and evaluation of new technologies and architectures, as well as developing security solutions. PPPs with adequate funding options have a proven track record of success in helping advance the goals of the United States and continuing its leadership. For example, in the space industry successes have included the ACTS Gigabit Satellite program development by NASA as well as the recent Mission to the Moon initiative.[4] The U.S. government should look to develop similar large-scale projects for 5G, including in the areas of satellite communications, spectrum efficiency, optical communications, artificial intelligence and machine learning.

However, to ensure the United States can continue its leadership into the future, such programs must also focus on the next generation of technologies, 6G, where work has only just begun. The earlier United States industry can become a leader in 6G the better positioned the United States will be to continue its leadership in the development and deployment of new communications technologies that benefit the country. To this end, areas such as quantum communications would be an important forward area of research and development projects.

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[4] *See e.g.* Switchboard in the Sky: The Advanced Communications Technology Satellite (ACTS), NASA (rel. June 2020); *see also* NASA Artemis Program, webpage, (available a https://www.nasa.gov/artemisprogram); the White House, "We're Heading Back to the Moon and then on to Mars," Vice President of the United States Michael Pence, Blog (rel. July 20, 2019).

When developing the framework for core security principles for 5G infrastructure it is imperative that the U.S. government make sure it is simple, harmonized and transparent. First, to the extent possible, the U.S. government should encourage the private sector to develop best practices. A good example of a successful best practice model are the principles adopted by the Satellite Industry Association.[5]

In addition, to the extent that the U.S. government finds a need for further action, any requirements should be developed through a multi-stakeholder approach and only establish technology-neutral baseline requirements. This approach will allow stakeholders to utilize the most appropriate technological solutions to meet this baseline. Failure to allow such flexibility will stifle innovation and ultimately result in outdated technologies being utilized that will not be able to stand up to the evolving world of cyber-attacks.

This baseline should set minimum standards for the following:

1. Enhanced and flexible authentication and authorization methods to support many use cases within and outside the telecom industry including IoT and edge computing;
2. Enhanced user privacy against such things as false base station and other eavesdropping attacks and the continued use of encryption and integrity protection; and
3. Service Based Architecture (SBA) and Interconnect Security instead of legacy point to point to support the protection of next generation transport and application layers, protection of the communication between core network entities at the internet protocol (IP) layer and security between different operator networks.

Once developed, these baseline requirements can be used through a variety of methods to incent compliance. Incentives can range from putting in requirements for certain types of security in government contracts that vendors have to reach, to providing more streamlined regulatory approvals for items like export/import licenses, should the product being exported/imported meet a certain level. In addition, programs such as those involving "Bug Bounties" for identifying bugs and/or vulnerabilities in security networks similar to those that are currently used by the private sector can be leveraged by the U.S. government to put into effect similar programs. These types of incentives will encourage reporting of security gaps on a timely basis so action can be taken.

One of the reasons for potential security gaps in U.S. infrastructure is due to the lack of shared information between private sector participants as well as between the U.S. government and the private sector. Sharing of information in a competitively-neutral manner is important as a means of filing finding potential security gaps in U.S. infrastructure, and this is something that has been recognized by NTIA by virtue of its recently released Request for Comment to Promote sharing of supply chain security risks between the Government and Industry.[6] The development of a forum

[5] Satellite Industry Association, *Cybersecurity,* Webpage, available at https://sia.org/policy/cybersecurity/ (last visited June 12, 2020).
[6] *See* Promoting the Sharing of Supply Chain Security Risk Information between Government and Communications Providers and Suppliers, Request for Comment, Docket No. 200609-0154 (rel. June 2020).

where government and industry participants can comfortably share security information should be developed with adequate protections.

Furthermore, while security is vital, it fails without adequate user and consumer education. Accordingly, an educational component that informs users and the public of how to best protect and secure their security digital identity must be developed through public-private partnerships. For example, the Federal Communications Commission has a Consumer Bureau that is focused on educating consumers about communications services. Offices, such as this, should be utilized to share relevant information with users directly and through third party channels, such as consumer groups such as AARP, who can further share relevant information. Such educational efforts have worked successfully, a good example being the whole of government approach to educating the public about the transition from analogue to digital televisions.[7] Together government and the private sector can increase the awareness regarding the security of 5G infrastructure and the actions that need to be taken to enable increased security in our 5G world.

Vendor diversity is an important part of the country's 5G security; and Hughes agrees with NTIA that there must be a diversity of networks and vendors to support security (e.g., through redundancy and resiliency) as well as to promote competition. The 5G ecosystem is unique since 5G is foreseen as a network of networks.[8] However, government contracts and regulation must encourage the use of multiple technologies that meet all the requirements of 5G (e.g., reliability).

In addition, in order to continue to lead in 5G and beyond, the U.S. government must also take action to relieve unnecessary and burdensome regulations. To encourage U.S. based operators to launch and operate U.S. satellites and use the United States as a licensing administration and not the International Telecommunications Union as the filing administration, it is important that the Federal Communications Commission (FCC) address several areas where U.S. regulation is excessively burdensome. These areas include excessive bond requirements, "Three Strikes Your Out" Rules, and lack of flexibility in fleet management. All of these areas are even more burdensome when compared to other space faring nations that the United States competes with.

As mentioned, no other government in the world requires the use of bonds for ITU filings or the licensing of space stations, which adds unnecessary and burdensome costs to operators. This means that U.S. operators are competing with foreign satellite operators who do not face such additional costs. In addition, satellite operators are unable to seek a license for a satellite system if they have failed to develop three satellite systems which they were licensed for. While this rule was developed to limit speculation, in fact, it limits the ability of operators to use the United States as a filing administration to develop satellite systems which are key parts of our communications infrastructure.

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[7] *See e.g.* Federal Communications Commission, *DTV Transition Consumer Guide Archive*, Webpage, March 12, 2019, available at https://www.fcc.gov/consumers/guides/dtv-transition-consumer-guide-archive (last visited June 12, 2020)(showing and linking consumers to a number of different guides explaining the Digital TV Transition and what to do); *see also* Federal Communications Commission, *DTV Consumer Education Initiative*, Final Rule, 73 FR 15431 (published March 24, 2008)(adopting rules that required industry to participate in a "coordinated nationwide, consumer outreach campaign" to ensure that consumers are informed of the transition).

[8] ESOA, *Satellite Communication Services: An integral part of the 5G Ecosystem*, White Paper, at 4 (rel. Jan. 2020).

Further, the FCC has very strict rules governing fleet management, such as obtaining approval even before very minor maneuvers or other changes. Each one of these areas discourages U.S. operators from using and oftentimes, even considering, the United States as their licensing administration. This is inconsistent with the President's Space Directive's that aim at ensuring the United States is a leader in space and should be rectified.[9]

Similarly, in its Spectrum Frontiers Order, the FCC imposed strict siting limitations on gateway earth stations in the 27.5-28.35 MHz, 37.5-40 GHz and 47.2-48.2 GHz bands.[10] These rules allow only three gateway earth stations per county or partial economic area (PEA), and only in the remotest of sites with low population density and distanced from things such as roads, railroads and ports. These limitations are particularly troublesome for today's broadband satellite networks which may have tens of earth stations to support its requirements. Because of the numerical and geographic limits, satellite operators today are more likely to consider locating their gateway earth stations off-shore (even if Mexico and Canada) where such limits do not exist. The United States government should avoid such restrictions which encourage their leading industries to move off-shore.

In addition, to encourage global deployment of U.S. satellite systems to deploy 5G it is imperative that there be adequate globally harmonized spectrum. To this end, the United States both domestically and as it prepares for the next World Radiocommunication Conference, must ensure that there is adequate spectrum to support the satellite industry, especially with the increase in demand for high-speed, large throughput and high capacity satellite systems, such as Hughes. Unfortunately, in recent years, U.S. support on protecting existing as well as making new allocations for satellite systems has waned. This has encouraged U.S. companies to look for more friendly administration with which to work through.

Furthermore, there needs to be increased predictability and consistency with regards to regulatory frameworks impacting U.S. telecommunications companies and trade. For instance, the Department of Commerce has placed broad restrictions on U.S. company dealings with Huawei, while also issuing temporary general licenses authorizing certain dealings with Huawei. The constantly changing regulatory landscape with respect to trade imposes substantial burdens and confusion for U.S. telecommunications companies that are contractually bound to continue supporting existing networks, while also looking towards competitive opportunities in 5G and beyond. Instead of adopting a patchwork of restrictions on goods from China or other targeted actors, the United States government should adopt consistent and clear regulations, such as establishing a clear baseline of allowable transactions involving imports and exports of technology. Such an approach will allow U.S. telecommunications companies to target and meet short- and long-term objectives in furtherance of 5G and other emerging technologies.

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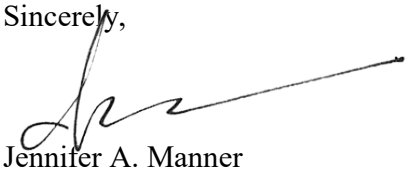
[9] *See e.g. Presidential Memorandum on Reinvigorating America's Human Space Exploration Program*, Memorandum (rel. Dec. 11, 2017); *see also* Presidential Memoranda, *Space Policy Directive-2, Streamlining Regulations on Commercial Use of Space*, Memorandum (Issued May 24, 2018); Presidential Memoranda, *Space Policy Directive-3, National Space Traffic Management Policy*, Memorandum (Issued June 18, 2018).

[10] *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, FCC 16-89, 31 FCC Rcd 8014 (2016).

U.S. communications companies, including those in the satellite sector, and the U.S. government, have a significant stake in standards development for 5G and beyond progress. Given these shared interests, the U.S. government can best promote greater U.S. private sector participation by creating and supporting partnerships and forums for collaboration. A good example of successful projects in this regard is to look at Europe's efforts through, for example, the European Space Agency, to advance space-related standards in forums such as 3GPP.[11] It is important that the United States government support these types of collaborations that include relevant government agencies, operators, vendors, and chipset makers as well as other stakeholders, such as applications providers. This approach will not only encourage greater participation in the standards bodies, but also greater unity of interest.

EchoStar/Hughes appreciates the opportunity to respond in this important proceeding United States' leadership in 5G and the deployment of a secure, reliable 5G ecosystem in the United States and abroad is an important goal for the country and one that EchoStar/Hughes is proud to support.

Sincerely,



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[11] *See* European Space Agency, *telecom artes 4.0 programme,* Webpage, available at https://artes.esa.int/satellite-5g. (last visited June 12, 2020).