

ONE HUNDRED FOURTEENTH CONGRESS
Congress of the United States
House of Representatives
COMMITTEE ON ENERGY AND COMMERCE
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March 27, 2015

Dr. Herbert Lin
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Dear Dr. Lin:

Thank you for appearing before the Subcommittee on Oversight and Investigations on Tuesday, March 3, 2015, to testify at the hearing entitled "Understanding the Cyber Threat and Implications for the 21st Century Economy."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. The format of your responses to these questions should be as follows: (1) the name of the Member whose question you are addressing, (2) the complete text of the question you are addressing in bold, and (3) your answer to that question in plain text.

To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Friday, April 10, 2015. Your responses should be mailed to Brittany Havens, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, D.C. 20515 and e-mailed in Word format to brittany.havens@mail.house.gov.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Tim Murphy
Chairman
Subcommittee on Oversight and Investigations

cc: The Honorable Diana DeGette, Ranking Member, Subcommittee on Oversight and Investigations

Attachment

Attachment 1—Additional Questions for the Record

The Honorable Tim Murphy

1. Each witness provided a slightly different perspective on cyber threats and the challenge of cybersecurity, extending from the past, to the present and future.
 - a. Are there areas where you feel there is a common view or shared theme and what is it?
 - b. If there was one fundamental message you want Congress and the public to understand about cybersecurity, what would it be?
 - c. Are there specific issues or areas of this issue that do not receive an appropriate level of attention?
2. As the promise of innovation connects more of our lives to cyberspace – from smart pacifiers to cars that communicate with each other – cyberspace becomes, in theory, a limitless attack surface.
 - a. How do we manage the risks presented by “smart devices” and the Internet of Things while also enjoying the benefits and convenience they offer to society?
 - b. As more devices connect to cyberspace and interact with one another, what challenges does this present for how security professionals or companies anticipate potential vulnerabilities or risks?
 - c. How do we assess the security of individual products relative to the security of the system as a whole?
 - d. In such an interconnected world, how do you draw the line between a potential vulnerability and a realistic vulnerability? In other words, just because something is possible, how important is it to assess the probability that it will occur?
3. Quite a few respected technologists – at Google, and also at the Institute of Electrical and Electronics Engineers Computing Society – have theorized that in the future, the Internet will be so integrated into our daily lives that it will become “invisible” and provide “seamless intelligence.”
 - a. Can you expand a little more on how exactly a world with an “invisible” Internet would work?
 - b. Do you agree with these predictions? Why or why not?
4. No matter how much money a company invests in security software, training and other cybersecurity measures, they still remain vulnerable to the insider threat. This can range from the intentional actor – such as a disgruntled employee stealing information or letting

the bad guys in – to inadvertent actors – such as an employee clicking an infected link in a targeted phishing email.

- a. Will companies ever be able to prevent internal threats – employees lowering the proverbial draw bridge – regardless of whether their actions are intentional or unintentional?
 - b. If it can never be eliminated, does it come down to managing risk? Are there proven strategies to minimize this risk?
 - c. How significant of a challenge is this to those evaluating the cost benefit of security measures?
5. Information sharing, though it has its benefits, is still a reactionary solution. Someone has to first suffer an attack before that threat information can be shared, and oftentimes the attackers change their signatures from target to target.
- a. How does information sharing help reduce the gap between cybersecurity capabilities and threats to cybersecurity described in your written testimony?
 - b. There is a lot of focus on signatures when it comes to information sharing.
 - i. Are signature-based defenses effective? Why or why not?
 - c. How does information sharing fit into the broad picture of the cybersecurity challenge?
 - i. Does it offer opportunity beyond improving our defensive capabilities?
6. Is it possible to quantify the benefits of the Internet and information technology relative to the cost of security?
- a. In other words, is it possible to calculate the economic benefits of these technologies relative to the economic costs of cybersecurity, including prevention and response in the event of a breach?
 - b. How about the social, cultural or other less tangible benefits?
 - c. Is there value in this?
7. Discussions about cybersecurity often focus on prevention or keeping actors out of system - Is this the right way to approach this issue?

- a. If there is no guarantee the bad guys will not get in, should the emphasis shift to a focus on resilience rather than prevention?
 - b. Why is the concept of resilience important to effective cybersecurity?
 - c. How does resilience support a risk-based approach to cybersecurity?
8. Dr. Lin, in your testimony you said that “complexity is the enemy of cybersecurity.”
- a. Is it possible to reduce this complexity?
 - i. If yes, what are the consequences?
 - ii. If no, why not?

Based on what you said about the complexity of a system increasing when additional components are connected to it, the “Internet of Things” is going to exponentially increase the complexity of the Internet.

- b. What does this mean for the governments, businesses, and individuals that are going to use these connected devices?
 - c. How will this influence or reshape current cybersecurity practices?
9. In the last few years, there have been several significant compromises and vulnerabilities discovered in regards to digital certificates and Certificate Authorities, two of the best well-known being the compromise of DigiNotar and the recent Lenovo/Superfish revelations. This raises questions as to whether the digital certificate model is providing an adequate level of security for users of the Internet.
- a. What are the weaknesses in the digital certificate model?
 - i. How significant are these weaknesses?
 - ii. Can these weaknesses be eliminated or adequately mitigated?
 - b. Are Certificate Authorities subject to any form of oversight?
 - i. If so, by whom and how does this function?
 - ii. If not, would enhanced oversight help address the weaknesses examined in Question 1? Why or why not?
 - c. Are there alternatives to the digital certificate model?

- i. If so, what are they?
 - ii. If not, how can the current digital certificate ecosystem be improved?
10. In your written testimony you describe how tradeoffs between security, innovation, and convenience are unavoidable.
 - a. What is required to achieve consensus on tradeoffs? Is such a consensus possible?
 - b. Is there a way to narrow these tradeoffs, such as by developing a technology that is at once secure as well as convenient? How much more difficult is this kind of development?
11. In your testimony, you described a two-part goal for reducing threats in cybersecurity. The first is reducing the gap between average cybersecurity posture and the best possible cybersecurity posture. The second is research and development of the best possible cybersecurity posture.
 - a. Between these two goals, which is more attainable? Why?
 - b. Which is more critical to our long term economic success?
 - c. Are we making progress on either goal? If so, how and what is driving this change?

The Honorable Markwayne Mullin

1. It seems like whenever we start talking about the challenges that come with responding to any emerging industry or emerging threat, the issue of workforce development is front and center. With something like the engineering industry, we know we need to engage more students in STEM education, should we be treating the IT industry in the same way?