

Written Testimony of
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Subcommittee on Information Technology,
Committee on Oversight and Government Reform,
U.S. House of Representative

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We are pleased to contribute written testimony to the Committee regarding the cybersecurity workforce talent gap, particularly with regard to the committee’s interest in public and private skills shortages, and the prospects for an industry-government rotational workforce. As representatives of one of three national cybersecurity centers founded through the Hewlett Foundation Cyber Initiative—and the only one at a Tier One public research university—we are deeply concerned about the shortage of cybersecurity professionals to fill available jobs. UC Berkeley will contribute to narrowing the human capital gap as we plan to launch in 2018 an online cybersecurity masters’ degree program that will be available to students across the country.¹

At the same time, we believe that the committee should focus its attention not just on the numbers that describe the cybersecurity labor market gap, but on the specific reasons why skills are lacking and jobs remain unfilled. We believe that one significant reason the federal government is struggling to fill its cybersecurity workforce is that there are few opportunities for private-sector technologists to work for the government without having to relocate to Washington, DC to take a permanent government job. Put simply, the dynamic flows of knowledge and talent that energize the Silicon Valley technology and human capital ecosystem are not mobilized to the benefit of government cybersecurity needs. In the below testimony, we outline the skills shortage issue and propose a solution—a Silicon-Valley based Cyber Workforce Incubator—that can address this urgent challenge.

Importantly, we do not believe that this organization should be based in a federal agency, nor should it be solely funded by federal dollars. An independent 501(c)(3) in the model of In-Q-Tel, and funded jointly by the government and private sector, will best reduce the friction that discourages private-sector technologists from working on government problems, and often prevents West Coast talent from working in East Coast government agencies.

The Nature of the Cybersecurity Skills Shortage Problem

Cybersecurity is arguably the fastest-growing and most important subfield of information technology. Yet the dramatic rise in the importance of cybersecurity has been accompanied by a severe shortage of trained professionals. In the private sector, “[t]he demand for the [cyber security] workforce

¹ For more information, see cybersecurity.berkeley.edu.

is expected to rise to 6 million (globally) by 2019, with projected shortfall of 1.5 million.”² Already, more than 209,000 cybersecurity jobs in the United States are unfilled; demand is expected to grow by 53 percent through 2018.”³ Cisco estimates there are more than one million unfilled cybersecurity jobs worldwide,⁴ while the UK House of Lords estimates two million.⁵

The United States cybersecurity infrastructure has also struggled to recruit private-sector talent into the federal government. The Department of Defense aimed to find 6,200 operators to fill CYBERCOM’s 133 Cyber Mission Force teams by 2018, with an interim goal of reaching “initial operating capacity” by the end of 2016.⁶ In 2015, Admiral Mike Rogers said that CYBERCOM was “already hard pressed” to find qualified candidates to fill its 133 Cyber Mission Force teams.⁷ As of January 2017, there are reportedly 123 teams, with only 27 operating at full capacity.⁸ These problems are not limited to the military; even prior to the recently implemented hiring freeze in the federal government, more than 1,000 federal cybersecurity jobs were unfilled.⁹

The prototypical way of explaining this cybersecurity labor market shortage is to describe it as a “market failure” into which the government should intervene. But we believe that treating the entire cybersecurity market as a unilateral entity that is “failing”, or to assume that one policy solution could resolve this problem, would be a mistake. Instead, there are likely multiple markets for cybersecurity professionals, and/or multiple challenges or failures to be faced, requiring separate solutions.

We focus here on one particular market problem: today, when the US Government wishes to solve digital national security problems, it almost exclusively draws upon East Coast-based government employees or contractors. With rare exception, the West Coast’s private-sector cybersecurity technologists, who often have precisely the skills most needed in the federal government, have displayed little interest in working for the national security community. While senior cybersecurity leaders recognize the need for this talent, many structural, bureaucratic, and cultural factors have contributed to the acute government labor shortage, including:

² Steve Morgan, “One Million Cybersecurity Job Openings In 2016.” *Forbes* (Jan. 2, 2016) (quoting Michael Brown, CEO of Symantec), <https://www.forbes.com/sites/stevemorgan/2016/01/02/one-million-cybersecurity-job-openings-in-2016/#3bd0a4b827ea>.

³ Setalvad, Ariha. “Demand to Fill Cybersecurity Jobs Booming.” Peninsula Press (March 31, 2015), <http://peninsulapress.com/2015/03/31/cybersecurity-jobs-growth/>.

⁴ Cisco. *Mitigating the Cybersecurity Skills Shortage* (2015), <http://www.cisco.com/c/dam/en/us/products/collateral/security/cybersecurity-talent.pdf>.

⁵ Morgan, Lewis, “Global shortage of two million cyber security professionals by 2017,” IT Governance (Oct. 30, 2014), <http://www.itgovernance.co.uk/blog/global-shortage-of-two-million-cyber-security-professionals-by-2017/>.

⁶ United States. Department of Defense. “The Department of Defense Cyber Strategy.” April 2015. https://www.defense.gov/Portals/1/features/2015/0415_cyber-strategy/Final_2015_DoD_CYBER_STRATEGY_for_web.pdf

⁷ Rogers, Mike. “A Statement of Admiral Michael S. Rogers, Commander, United States Cyber Command, Before the House Committee on Armed Services Subcommittee on Emerging Threats and Capabilities.” March 4, 2015. <http://docs.house.gov/meetings/AS/AS26/20150304/103093/HHRG-114-AS26-Wstate-RogersM-20150304.pdf>

⁸ Maucione, Scott. “CYBERCOM’s New Buying Power Now Closer to Reality.” *Federal News Radio*, January 2017. <http://federalnewsradio.com/acquisition/2017/01/cybercoms-new-buying-power-now-closer-reality/>

⁹ Sternstein, Aliya. “Trump’s hiring freeze blunts rush to recruit cybersecurity talent.” *Christian Science Monitor Passcode*, January 25, 2017, <http://www.csmonitor.com/World/Passcode/2017/0125/Trump-s-hiring-freeze-blunts-rush-to-recruit-cybersecurity-talent>.

- Demand for cybersecurity professionals that is expanding rapidly across sectors, leaving the federal government in competition with the private sector for top talent;
- A cultural disconnect between ‘West Coast’ and ‘East Coast’ work styles, which is partially the result of lengthy, bureaucratic decisionmaking that can delay testing and implementation of new technology solutions, as well as poor work environments in aging government buildings;
- Organizational tensions between government and private sector work structures, including lengthy, cumbersome security clearance processes that often cause applicants to lose interest in government jobs before their application process is completed, and security policies that can unnecessarily isolate employees from their social and professional networks;
- Geographic and career rigidities within the federal government, including risk averse government managers, and relocation requirements from preferred technology hubs like Boston, Austin, and, most importantly, Silicon Valley to the greater Washington, DC area; and
- The inability to easily transition between government and private-sector roles, particularly since it may be difficult to stay current on the latest private-sector technological developments while working in government.

While the US Government is already seeking to remedy these organizational challenges on a piecemeal basis, it takes significant time and effort to change large organizations. To make cybersecurity agencies hospitable to highly innovative, private-sector technologists would require senior US Government leaders to make significant and simultaneous structural changes to HR and security policies, professional incentives, work environments, and management techniques. Such changes would almost certainly be disruptive to the existing workforce and would likely be met with resistance from current government employees, rendering the changes ineffective.

Moreover, even if the US Government *could* find ways to convince sufficient numbers of West Coast professionals to relocate to Washington, we do not believe this would be advisable because the quality of that talent depends precisely on its intimate, ongoing connection to the entrepreneurial ecosystem present in Silicon Valley. This ecosystem, which is most fertile in Silicon Valley but also present in other entrepreneurial hubs, develops talent through:

- A culture of relentless experimentation and the nimbleness to shift resources away from “dead ends” with relatively little friction;
- A relatively open labor market where people circulate and re-mix expertise by moving around through different companies;
- A large and dynamic professional community that shares common values, and that is continuously re-infused with research and thought leadership by two of the world’s top universities; and
- Powerful economic incentives that encourage the rapid commercialization of emerging technologies.

Especially in the short to medium term, this system simply cannot be replicated inside government. As a result, it is important for the federal government to find a way to access cybersecurity talent within the Silicon Valley ecosystem, and not remove talent from it.

A New Model for an Industry-Government Rotational Workforce: The Cyber Workforce Incubator

We have so far argued that West Coast cybersecurity professionals do not want to work for the federal government under current conditions. But this is not the same as saying that West Coast cybersecurity professionals do not want ‘government jobs’ per se. We believe that, if such professionals were given the ability to work on national security challenges without degrading their cutting-edge technical skills or requiring them to give up their livelihoods, work cultures, and social networks—and to leverage that experience to advance their career—many would jump at the opportunity.

Other proposed industry-government rotational workforce solutions—such as a Cyber Reserve Force or temporary appointments within the US Digital Service—are not well equipped to provide this type of work experience. While a traditional rotational program would reduce one barrier to entry—enabling short-term private-sector engagement with interesting US Government problems—it would not attract those deterred by the cultural differences, geographic distance, or career rigidities within the federal government.

We have released a white paper, “Cyber Workforce Incubator,” (available at <https://cltc.berkeley.edu/>, and attached as an appendix), describing an institution that we think could better attract the West Coast’s best technologists to work for the US Government. Through a careful application and vetting process, the CWI would choose promising private-sector candidates for a one- or two-year workforce development program. Participants would undergo a rapid security clearance process before joining specialized teams that have needed technology skills; collaborate with defense, intelligence, and homeland security partners; and work on discrete projects that achieve defined mission objectives. CWI would replicate the environment, culture, and pace of West Coast startups, dramatically increasing the benefits and reducing the costs for private-sector technology talent to engage in national service. CWI would also provide state-of-the-art training and mentorship to participants, who will complete the program with new and more refined skills that will ultimately benefit federal, non-profit, or corporate employers. Incubator participant stipends would combine federal dollars and corporate donations, ensuring that private-sector organizations share some of the costs of training talent from which they will benefit

By giving technologists and government workers the opportunity to work side by side on unique government problems through short deployments, an incubator will fill a unique workforce niche that government agencies cannot solve themselves or through conventional contractor relationships with academics or private-sector companies. By overcoming a manageable number of geographic and bureaucratic hurdles, such an incubator can help the US government to solve some of its toughest technical innovation challenges, recruit top talent, build a strong reputation, and lay the groundwork for long-term, private-sector cyber technology innovation partnership that will benefit the nation for generations.

We do not believe such an organization should be housed in a federal agency. Instead, following the model of In-Q-Tel and its relationship to CIA, the CWI should be an independent 501(c)(3) nonprofit that is anchored to a particular agency—likely the Department of Defense, CYBERCOM, or NSA—but also serves the needs of other sister agencies. In-Q-Tel, which operates as a venture capital resource to promote technology development for the intelligence community, functions differently than a government agency because of its independent status. In-Q-Tel has successfully identified promising early-stage technologies for the intelligence community because it stands between the public and private

sectors, and so can understand the needs of the intelligence community and translate those needs to start-ups. A cybersecurity incubator could similarly identify promising solutions to difficult problems through its ability to liaise between the public and private sector. This structure would also make it possible for the incubator to work on problems that sit under different authorities (e.g., Title 10 and Title 50).

We believe that joint federal and private-sector funding is the best model for setting up a Cyber Workforce Incubator. Because the CWI experience will provide its participants with marketable skills, the private sector should share the burden in supporting participant stipends and direct operating costs. At the same time, federal investment is necessary to set up the organization, and to demonstrate ongoing US Government support for the initiative. Federal expenses will likely be more significant in the first few years of operation, and will decrease as CWI develops the expertise, relationships, and reputation required to consistently raise private funds.

Conclusion

Today, the nation's most talented cyber technologists face a stark choice between private- and public-sector employment. This choice does not serve the nation well, and the costs to national security are mounting as technology evolves and the gap between the private- and public-sector workplace experiences widens. CWI provides the US government with a low-risk, high-impact, and organizationally proven way to leverage top talent without also needing to massively restructure its own work environment, incentives, and systems. We urge the Committee to consider this model as a way to begin closing this particular aspect of the cybersecurity workforce talent gap.

About the Authors

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The Center for Long-Term Cybersecurity is a research and collaboration hub housed within the University of California, Berkeley School of Information (I School). Funded through a generous seed grant from the William and Flora Hewlett Foundation, the CLTC has a mission to design solutions to cybersecurity issues that arise wherever humans and digital systems interact, based on a long-term vision of the internet and its future. Working with researchers from UC Berkeley and outside organizations, we are building a diverse community of partners to advance concepts, technologies, and recommendations that will help governments, corporations, and individuals better prepare for the challenges of cybersecurity throughout the 21st century. We focus our work on three streams of activity: Research, Education, and Engagement.

CENTER FOR LONG-TERM CYBERSECURITY



CLTC OCCASIONAL WHITE PAPER SERIES

Cyber Workforce Incubator

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Summary

The United States urgently needs highly innovative, technically trained personnel for cyber defense and security to protect critical infrastructure and assure vital military and civilian missions. The Defense, Intelligence, and Homeland Security communities struggle to acquire, train, and retain sufficient numbers of cutting-edge technologists who can help the government innovate faster and more effectively than our adversaries, specifically in the domain of cybersecurity.

Cyber defense and security require a highly skilled, deeply technical workforce that has experience with the latest hardware and software as well as the know-how and mindset to solve a wide range of complex, ambiguous problems. Women and men across the West Coast have these capabilities because they live and work in a regionally distinctive innovation ecosystem that enables them to constantly upgrade their knowledge and experience. Today, however, they have no viable, short-term professional opportunities to place their talents in the service of US national security. Moreover, even when the government can attract these workers, those who choose to stay often struggle to keep abreast of fast-moving technology developments in the private sector, which is the center of cyber innovation. This places our government in a position of structural disadvantage. We propose here an approach to overcome and reverse that.

A new, nimble, and innovative not-for-profit Cyber Workforce Incubator would allow the West Coast's best technologists to work on national security challenges without degrading their cutting-edge technical skills or requiring them to give up their livelihoods, work cultures, or social networks. By giving technologists and government workers the opportunity to work side by side on unique government problems through short deployments, an incubator will fill a unique workforce niche that government agencies cannot solve themselves or through conventional contractor relationships with academics or private-sector companies. By overcoming a manageable number of geographic and bureaucratic hurdles, such an incubator can help the US government to solve some of its toughest technical innovation challenges, recruit top talent, build a strong reputation, and lay the groundwork for long-term, private-sector cyber technology innovation partnership that will benefit the nation for generations.

Introduction

Today, the private sector dominates technology innovation in cybersecurity and data science. Thanks to the rapid growth of private-sector technology companies, large segments of the nation's best technology talent are building commercial products and services in established companies and startups, especially on the West Coast. As primary drivers of global technology innovation, these companies are combining speed, agility, ingenuity, creativity, and the profit motive to fundamentally change how humans and machines interact everywhere on the planet. The men and women who work in these companies are driving the future of technology and in the process profoundly shaping how and where the work of cyber innovation takes place.

The United States does not currently have an agile way to leverage the talent of these cybersecurity operators to solve tough, often classified, government cybersecurity problems. As a result, the government is also falling behind in its efforts to create a more resilient federal cybersecurity infrastructure. A not-for-profit Cybersecurity Workforce Incubator (CWI) will help address this problem by providing a low-risk, high-impact, and organizationally proven way to get top West Coast technologists focused on critical mission work. Such an organization would also serve as a unique example of government workforce innovation, as it will draw features from private-sector startups — such as team-building, a risk mindset, and innovation culture — and put them in the service of the government.¹



The Cybersecurity Workforce Gap

The United States cybersecurity infrastructure — particularly US Cyber Command (CYBERCOM), the Military cybersecurity components, and the Department of Homeland Security (DHS) — struggle to recruit private-sector talent into the federal government. The Department of Defense (DOD) has aimed to find 6,200 operators to fill CYBERCOM's 133 Cyber Mission Force teams by 2018, with an interim goal of reaching “initial operating capacity” by the end of 2016.² In 2015, Admiral Mike Rogers said that CYBERCOM was “already hard pressed” to find qualified candidates to fill its 133 Cyber Mission Force teams.³ As of January 2017, CYBERCOM is reported to have 123 teams, with only 27 operating at full capacity.⁴ These capacity problems are not limited to the military; before the Trump Administration implemented a hiring freeze on the federal government, more than 1,000 federal cybersecurity jobs remained unfilled.⁵

In 2013, the DOD released its Cyberspace Workforce Strategy, which recognized that the Department faces “fierce competition” in the labor market and must position itself as an “employer of choice” using a variety of tactics. One strategy the report recommended is to create more transition opportunities “between and within military and civilian service.”⁶ However, this strategy focused on retaining existing service members, rather than engaging the private-sector talent pool.

One reason that the federal government has struggled to recruit top cybersecurity talent is the East Coast-West Coast divide. Today, when the US Government wishes to solve classified national security problems, it almost exclusively draws upon East Coast-based government employees or contractors. With rare exceptions, the West Coast's private-sector cybersecurity technologists have displayed little interest in working for the national security community. While senior cybersecurity leaders recognize the need for this talent, many bureaucratic and cultural factors mute and dull the call to service, including:

- Lengthy, cumbersome clearance processes that often cause applicants to lose interest;
- Risk-averse government managers who sacrifice innovation to professional advancement;
- The cost and burden of relocating from preferred geographic technology hubs like Boston, Austin and, most importantly, Silicon Valley to the Greater Washington, DC area;
- Security policies that can unnecessarily isolate employees from their social and professional networks;

- Lengthy, bureaucratic decisionmaking that can delay testing and implementation of new technology solutions;
- HR policies and institutions that undermine short-term, meaningful work; and
- Poor work environments in aging government buildings.

While the US Government is already seeking to remedy these organizational challenges on a piecemeal basis, it takes significant time and effort to change large organizations. To make cybersecurity agencies hospitable to highly innovative, private-sector technologists would require senior government leaders to make significant and simultaneous structural changes to HR and security policies, professional incentives, work environments, and management techniques. Such changes would almost certainly be disruptive to the existing workforce and would likely be met with resistance from current government employees, rendering the changes ineffective.

Solution: A Cyber Workforce Incubator

To harness West Coast cyber technology talent and tap directly into the innovation ecosystem in which it grows, the US Government would benefit from a not-for-profit [501(c)(3)], San Francisco Bay Area-based Cyber Workforce Incubator that provides West Coast technologists with the unique ability to work with select personnel on important, classified national security challenges.

HOW IT WOULD WORK

Through a careful application and vetting process, the CWI would choose promising private-sector candidates for a one- or two-year workforce development program. Participants would undergo a rapid security clearance process before joining specialized teams that have needed technology skills; collaborate with defense, intelligence, and homeland security partners; and work on discrete projects that achieve defined mission objectives. CWI would replicate the environment, culture, and pace of West Coast startups, dramatically increasing the benefits and reducing the costs for private-sector technology talent to engage in national service. CWI

would also provide state-of-the-art training and mentorship to participants, who will complete the program with new and more refined skills that will ultimately benefit federal, non-profit, or corporate employers. Incubator participant stipends would combine federal dollars and corporate donations, ensuring that private-sector organizations share some of the costs of training talent from which they will benefit.

By removing the need for the government to make difficult and highly disruptive internal changes to attract top technical talent, CWI would help reduce the friction that prevents skilled private-sector technologists from working on mission-critical challenges. Several underlying assumptions make CWI uniquely attractive:

- 1 Participants will not have to relocate;
- 2 Their work is by definition temporary; and
- 3 Equipped with a new set of skills, they will return after one or two years to the private sector, where they can continue to work on innovative technologies that will help the US Government in the long run.

Once fully set up, CWI would be housed in its own physical location with both unclassified and classified (SCIF) workspaces. CWI would need authority and support to conduct fast-track clearance reviews—modeled on the Intelligence Community’s ability to provide rapid, temporary clearances to VIPs for forums like the Enduring Security Framework—so that CWI’s technologists can get a high-level clearance in a matter of 6-12 months.⁷ CWI would select incubator participants well before the start of the program to ensure they are able to complete their full clearance process.

By serving the defense, intelligence, and homeland security partners through this new model for public-private engagement, CWI would provide the following significant benefits:

Relationship To Existing Programs

Although CWI is fundamentally a workforce development innovation, it is not a high-risk endeavor because it borrows from techniques and approaches that are already proven by other organizations that work closely with US cybersecurity communities, including:

DARPA

The DARPA innovation model features project managers who come from industry and academia for short periods of time to work on hard, future-oriented technical challenges. When a new manager at DARPA receives an identification badge on Day 1, it also prominently features their last day of work two years later. The message is clear: innovation requires a period of intense focus and appropriate risk, not years of incremental change.

Key Lesson: Borrowing from the DARPA model, CWI will offer temporary one- or two-year positions to highly talented individuals who wish to work on cybersecurity technology challenges for a set time period.

IN-Q-TEL

This not-for-profit venture capital firm has successfully identified promising early-stage technologies for the intelligence community because it stands between the public and private

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sectors, allowing it to understand what the intelligence community actually needs and translate those needs to start-up companies in clear language. In-Q-Tel solves an important technology innovation supply-chain problem that acquisitions officers cannot fix themselves.

Key Lesson: Following the In-Q-Tel model, CWI will be a not-for-profit that will be funded both through the US Government and partnerships with corporations looking for CWI graduates. CWI will also build long-term relationships with government officials who need assistance solving time-sensitive, mission-critical technology challenges.

Y COMBINATOR

A funder and seed accelerator, Y Combinator provides the infrastructure, training, and resources necessary for young talent to set up their own technology companies. This firm's approach illustrates a powerful model for addressing the challenge of scouting and developing top technology talent.

Key Lesson: Using Y Combinator's example, CWI will foster team-based work, mentor-mentee relationships, and talent development, so that CWI "graduates" return to the workforce with a sophisticated set of marketable skills and experiences.

- Tiger teams capable of working on mission-critical, classified technology challenges;
- Technologists who are able to bring cutting-edge hardware and software solutions to intractable national security technical challenges and who can remain technically current during their CWI service;
- An elite group of private-sector technologists who may wish to work for the government for longer periods of time;
- An engine for improving the US Government's relationships and brand within Silicon Valley and other technology hubs;
- Knowledge and skill transfer from CWI participants to US government personnel, and vice versa;
- An intermediary organization that helps the US Government to better engage with West Coast start-ups and technology companies;
- A reputation for applying ingenious solutions to intractable workforce challenges that are endemic to the military and to civilian government operations;
- Hundreds of innovators and entrepreneurs who will "graduate" from CWI and go on to build hardware and software that benefit the Department of Defense and secure the nation; and
- A workforce innovation that complements and reinforces other types of technology outreach efforts, such as In-Q-Tel and DIUx.

RELATIONSHIP TO OTHER INITIATIVES

To our knowledge, there are no existing workforce programs that systematically allow the government to leverage top private-sector cybersecurity talent to work directly on actual national security challenges without also forcing those individuals to leave the West Coast and take 'permanent' government, military, or contractor jobs.

Consequently, CWI complements, but does not replicate, several existing efforts to drive workforce improvements in the US Government. For example, the Cyber Mission Force will come online in the medium term and will provide the DOD with cutting-edge

cyber operators from within the four military services. The US Digital Service, soon to be followed by the recently initiated Defense Digital Service, is already demonstrating promise as it matches private-sector technical talent to the general IT needs (e.g., website design) for US agencies. 18F, a federal digital consultancy run out of the General Services Administration (GSA), has already demonstrated value by building modern digital services for federal agencies; 18F successfully operates on a contracting model that allows technologists to work on government projects from offices across the country.⁸ DIUx, a DOD initiative that helps bridge the military with the private sector, and In-Q-Tel, a venture capital firm focused on identifying and investing in technologies that will benefit US national security, are well placed to identify and invest in technology for the defense and intelligence communities, respectively.⁹

CWI also complements, but does not replace or overlap traditional military, intelligence, and homeland security agency procurement of academic and private-sector company services. Academics provide deep expertise to the government, but they rarely work on mission-critical projects because they usually lack appropriate clearances, work according to a slower tempo, and must balance their work for the government with other university priorities. Private-sector contractors provide the government with a diversity of unclassified and classified technical services, including some that are core to mission. In many cases, the individuals performing these services are former military or intelligence agency individuals who have spent their whole careers as private-sector government contractors. These employees are often quite effective at solving known technical problems that can be described in a statement of work, but struggle to help the government apply cutting-edge cybersecurity knowledge to ambiguous problems that are hard to disaggregate and even harder to solve. Furthermore, contractors will always have incentives to solve technical problems in ways that generate more government contracting work for their companies.

*Relationship to Existing Programs
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UNITED STATES DIGITAL SERVICE (USDS)

The US Digital Service and Innovation Fellowships bring technological talent to the government. Currently in its second year, USDS has been tremendously successful at addressing conventional government IT problems, such as open government, record keeping, website design, and workforce efficiency.

Key Lesson: CWI can learn from the US Digital Service's ability to quickly assemble private-sector technologists into teams that are able to effectively solve complex, unclassified technology challenges.

DIUx

DIUx operates in and around major technology hubs and works to identify and pilot cutting-edge technologies that meet government mission needs. Today, DIUx is focused on building relationships with technology companies, funding pilots, and facilitating the procurement of promising, quickly deployable technologies.

Key Lesson: CWI can leverage the relationships that DIUx is building with technology companies, providing them with a new way to develop and retain their talent. CWI might also benefit from DIUx's physical space at Moffett Field.

Conclusion

Today, the nation's most talented cyber technologists face a stark choice between private- and public-sector employment. This choice does not serve the nation well, and the costs to national security are mounting as technology accelerates and the gap between the private- and public-sector experiences widens. CWI provides the US Government with a low-risk, high-impact, and organizationally proven way to leverage top talent without also needing to massively restructure its own work environment, incentives, and systems. Today, some of world's greatest technological talent resides within the West Coast's private-sector innovation ecosystem. CWI will, for the first time, make this talent available to address classified challenges while also conferring long-term strategic benefits to the US Government.



1 This paper focuses primarily on the role a cybersecurity incubator could play in assisting the Department of Defense, Department of Homeland Security, and related intelligence agencies in solving key cybersecurity problems. We encourage the adaption of this policy concept to other agencies' needs — for cybersecurity and beyond.

2 United States. Department of Defense. "The Department of Defense Cyber Strategy." April 2015.

https://www.defense.gov/Portals/1/features/2015/0415_cyber-strategy/Final_2015_DoD_CYBER_STRATEGY_for_web.pdf

3 Rogers, Mike. "A Statement of Admiral Michael S. Rogers, Commander, United States Cyber Command, Before the House Committee on Armed Services Subcommittee on Emerging Threats and Capabilities." 4 March 2015.

<http://docs.house.gov/meetings/AS/AS26/20150304/103093/HHRG-114-AS26-Wstate-RogersM-20150304.pdf>

4 Maucione, Scott. "CYBERCOM's New Buying Power Now Closer to Reality." Federal News Radio, 23 January 2017.

<http://federalnewsradio.com/acquisition/2017/01/cybercoms-new-buying-power-now-closer-reality/>

5 Sternstein, Aliya. "Trump's hiring freeze blunts rush to recruit cybersecurity talent." Christian Science Monitor Passcode, 25 January 2017. <http://www.csmonitor.com/World/Passcode/2017/0125/Trump-s-hiring-freeze-blunts-rush-to-recruit-cybersecurity-talent>

6 United States. Department of Defense. "Cyberspace Workforce Strategy." 3 December 2013.

[http://dodciCWIo.defense.gov/Portals/0/Documents/DoD%20Cyberspace%20Workforce%20Strategy_signed\(final\).pdf](http://dodciCWIo.defense.gov/Portals/0/Documents/DoD%20Cyberspace%20Workforce%20Strategy_signed(final).pdf)

7 The National Guard may also be able to facilitate fast-track clearance reviews through its use of the Defense Support of Civil Authorities (DSCA).

8 News Staff. "What is 18F?" Government Technology, 8 August 2016. <http://www.govtech.com/What-is-18F.html>

9 Other current efforts, such as the DOD's Force of the Future or the Loaned Executive Program at DHS, may also be instructive.



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