



Veteran Cyber Apprenticeships

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Employers Value Experience Protecting Our Country

Transitioning service members (TSMs) leave military service with a robust skill set applicable to nearly 1,000 civilian occupations.ⁱ For such highly-skilled workers, attaching to stable, engaging post-military employment should be seamless, yet up to 80% of service members transition out of service without secure employment,ⁱⁱ and nearly two-thirds of transitioning veterans leave their first job within a year.ⁱⁱⁱ

Apprenticeships are a good opportunity to address the high post-separation unemployment and turn-over rates for veterans because they offer a holistic training and employment package that allows TSMs to progress in their careers while adding value for their employers. Apprenticeship programs have high retention rates; 91% of apprentices retain employment after the program ends.^{iv}

Cybersecurity is a high-growth field with demand for veterans because of their security clearance and experience attending to security protocols. ICF has experience developing apprenticeships in this field through the DOL-funded Cybersecurity Youth Apprenticeship Initiative. This paper describes ICF's model for a veteran cyber apprenticeship program that will introduce the cybersecurity career pathway to TSMs and support them entering the civilian cybersecurity workforce, by:

1. helping TSMs visualize their career pathway in cybersecurity;
2. developing pre-separation training opportunities to earn core and advanced certifications;
3. matching TSMs to employers looking to develop new talent through apprenticeships; and
4. supporting TSM apprentices through peer support and virtual coaching.

Serving the Country as a Job Qualification

While most veterans say the military prepared them for active duty, only about half say they were well prepared for the transition to civilian life.^v Veterans say they lacked understanding of how their military skills related to civilian occupations, and felt that they needed for financial reasons to accept the first job offered without consideration for the work or the company culture.^{vi} Forty percent of service members believe private companies do not view their experience as a professional asset.^{vii}

One field that certainly views military service as an asset is cybersecurity. Cybersecurity positions are focused on protecting networks, devices, and data from unauthorized access or criminal use and the practice of ensuring confidentiality, integrity, and availability of information.^{viii} The seven specialty areas of cybersecurity work are displayed in Figure 1.

Figure 1. National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework



The cybersecurity field includes protecting national security data and the systems that store and process it. Security clearance is a valuable asset for a cybersecurity professional’s resume because it means an employer can put them to work immediately handling national security data without having to sponsor them for clearance, a process which can take months. ICF’s proposed veteran cyber apprenticeships would put TSMs to work on-site with an employer immediately after separation to leverage their military clearance and keep it current.

Apprenticeship: A New Approach for Transitioning to New Careers

TSMs who enter the civilian workforce face a decision about whether or not to pursue a career in alignment with their military occupational specialty. In making this decision, TSMs traditionally fall into one of three segments as outlined in Figure 2.

Figure 2. Veteran Career Path Choices^x

Segment 1	Segment 2	Segment 3
<p>Veterans who:</p> <ul style="list-style-type: none"> wish to continue with the type of work they did in the military, and wish to continue to build upon the career pathway they developed in the military. 	<p>Veterans who:</p> <ul style="list-style-type: none"> do not wish to continue in a similar field that they did in the military, but have identified the type of work they want to do in the civilian world. 	<p>Veterans who:</p> <ul style="list-style-type: none"> do not wish to continue in a similar field that they did in the military, and have not identified the type of work or career they want to move into after the military.



A study of veterans by the Institute for Veterans & Military Families at Syracuse University found that over half of TSMs are in Segment 3 – wanting to do something different.^x These veterans, along with those in Segment 2 who are looking to shift into a specific new industry, are most in need of enrolling in an apprenticeship program which will expose them to new occupations, workplaces, and employers. ICF's delivery of veteran cyber apprenticeships would entice TSMs to consider a career in cybersecurity by explaining its high demand, career pathway through stackable credentials, variety of interested employers, and high potential earnings.

The foundational elements of an apprenticeship program for TSMs have been established with the U.S. Department of Defense's SkillBridge Program. SkillBridge allows TSMs within six months of their separation to receive free or very low-cost civilian training while still on active duty, including an internship or an apprenticeship. SkillBridge can be a challenge, though, as it requires TSMs to request and be granted a release from active duty so they can enroll in an apprenticeship or on-the-job training in the civilian sector during their last months of service. Veteran cyber apprenticeships would respect the rigors of military service by providing flexibility in how active duty TSMs take classes for their cybersecurity credentials: in-person if attending class can fit around their service duties, or online if they need to study on their own time. ICF's veteran cyber apprenticeship model provides multiple active duty training pathways for in-person or online training, beginning with core skill credentials such as CompTia A+, Security+, and Cloud+ through management skill credentials such as Certified Information Security Managers (CISM), Certified Information Systems Auditor (CISA), and Certified Information Systems Security Professionals (CISSP).

Veteran Cyber Apprenticeships as a Path to Employment

Cybersecurity is a high-demand career pathway. Employers posted over 500,000 online job listings for cybersecurity-related positions from October 2018 through September 2019.^{xi} Projected growth between 2018-2028 for Information Security Analysts is 31.6%.^{xii} Demand is particularly high in California, Georgia, North Carolina, and Texas, which also have large bases that exit thousands of TSMs annually.

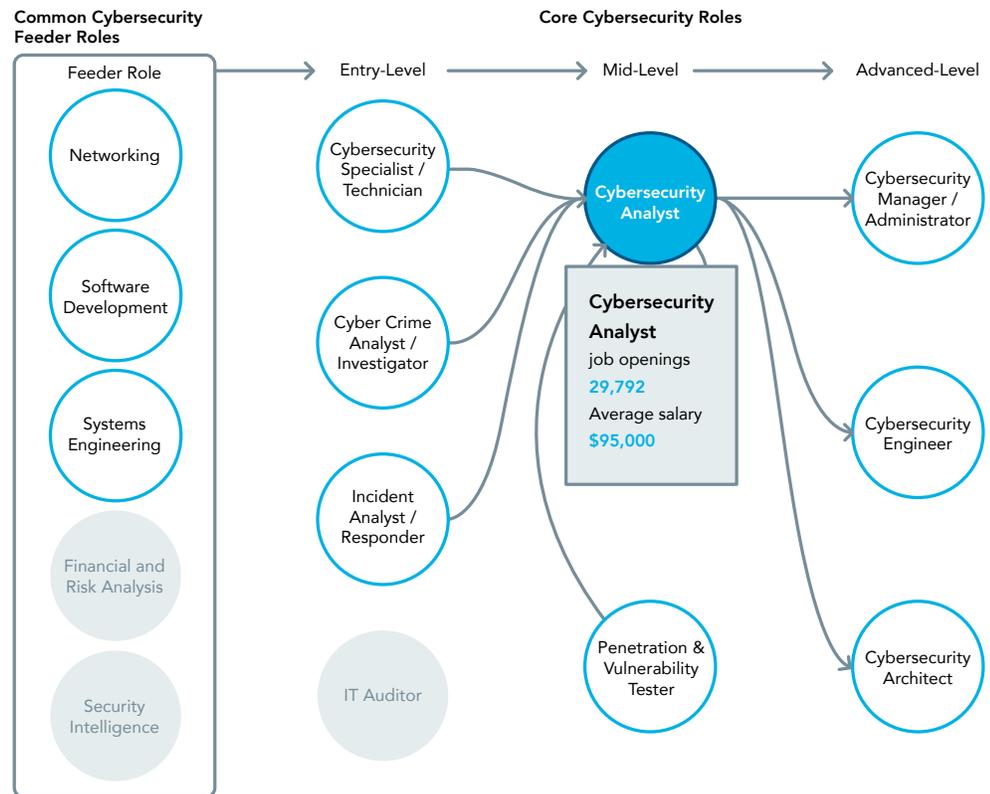
In order to prepare TSMs to build careers in this high-demand industry, ICF proposes a new approach to support TSMs as they transition to the civilian cybersecurity workforce: veteran cyber apprenticeships. The veteran cyber apprenticeship model is built around four components:

- 1. Helping TSMs visualize their career pathway in cybersecurity.** TSMs participate in the TAP Preparation for Employment workshop when they are starting their separation planning. This is the optimal time to introduce them to new career pathways, such as cybersecurity. ICF would prepare a short presentation for TAP facilitators to deliver during the one-day employment workshops. For TSMs that had already indicated an interest in apprenticeship by selecting the Vocational Training elective workshop, the focus would be on introducing them to the high-demand



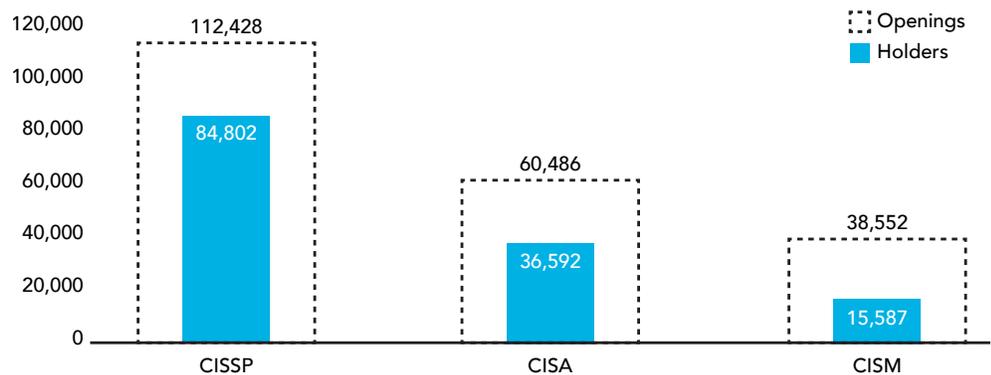
field of cybersecurity and potential employers. For those that expressed interest in entering employment or higher education immediately after separation, the emphasis would be on the earn-and-learn aspect of apprenticeships and the high earning potential of the cybersecurity field. Both versions of the presentation would include a “day in the life” video of a veteran employed in cybersecurity, and an explanation of cybersecurity pathways illustrated by the NICE CyberSeek Cybersecurity Career Pathway Interactive Map (Figure 3).

Figure 3. NICE CyberSeek Cybersecurity Career Pathway Interactive Map^{xiii}



2. Developing pre-separation related instruction opportunities. Focused and driven TSMs can pursue training toward an employer-recognized certificate as they complete their military service. Training delivery needs to be flexible to fit around their service duties, family responsibilities, and other transition activities, and could include on-base, off-base, and virtual options. A successful example of this is the Microsoft Software & Systems Academy (MSSA), which provides an 18-week training in fields such as cloud development, cloud administration, cybersecurity administration, and database and business intelligence administration. MSSA program graduates then interview at Microsoft or with the program’s 500 hiring partners. ICF’s veteran cyber apprenticeship would focus on preparing TSMs to become CISM, CISA, and CISSP certified. CISSP, CISA, and CISM have the greatest shortage of certificate holders compared to employer demand nationwide, as shown in Figure 4.



Figure 4. Nationwide Shortage of Cybersecurity Certificate Holders vs. Job Openings^{xiii}

Matching TSMs to employers looking to develop new talent through apprenticeships.

A survey conducted by Workforce Solutions of Texas Gulf Coast found that employers believe apprenticeships help them retain highly skilled workers: employers reported that apprenticeship-trained employees stay with their companies for six to ten years or more.^{xiv} The veteran cyber apprenticeships program will engage employers in a range of industries, from IT-focused firms to others that need to protect data security, such as banking and health care. Attracting high-demand cybersecurity talent may be a key motivator for businesses that have not previously embraced apprenticeships to start sponsoring apprentices. For example, government contracting firms might be willing to pay a premium to bring on TSMs with Bachelor's degrees, who can be placed in higher-billing project labor categories. Small and medium-sized business might prioritize the cost-savings from a TSM who has demonstrated his or her capability through the Armed Services rather than higher education. ICF's veteran cyber apprenticeship program will first focus in the following areas, where the country's largest Government IT contractors have concentrations of Computer Systems staff and the demand for cybersecurity professionals would be the greatest:

- San Diego: CACI, Verizon Communications, ManTech, CGI Federal, Leidos, Lockheed Martin, Perspecta, Engility
- Dallas-Ft. Worth: AT&T, Fluor, General Dynamics, Science Applications International
- Colorado Springs: AT&T, General Dynamics, BAE Systems, Engility, Lockheed Martin, Northrop Grumman
- Northern Virginia: Raytheon, CACI, ManTech, CGI Federal, Perspecta, Engility, BAE Systems, Northrop Grumman, Boeing, PAE
- Rockville: L3 Technologies, AECOM, ManTech, Leidos, Raytheon

3. Supporting TSMs entering the civilian workforce through peer support and virtual coaching. Hurdles for TSMs transitioning into the civilian workforce can include lack of planning, perceived limited access to transition programs, and various types of stigma, including the presumption of mental health issues.^{xv} ICF's veteran cyber

apprenticeship model provides virtual coaching to keep TSMs on track with separation and employment planning and connected to support services availability from the military and civilian workforce development systems. In the virtual coaching model, a pool of trained and prepared employment counselors can be scheduled for one-on-one coaching appointments over a video conferencing platform, providing maximum flexibility for the TSMs. The virtual coaches can also provide support and mediation when apprentices' and employers' needs are not aligned. As an additional support to TSMs adjusting to the civilian workplace, the veteran cyber apprenticeship program arranges peer networks for TSMs to discuss challenges and opportunities. Providing these multiple avenues of support will help cyber veteran apprentices feel more connected and supported in their new field.

ICF's Approach to Scaling Apprenticeships for Separating Service Members

ICF has spent the last ten years developing, managing, and improving work-based learning opportunities. Figure 4 identifies current and past projects which will be the building blocks for the veteran cyber apprenticeships.

Figure 5. Work-Based Learning Lessons from ICF Projects

ICF Project	Lessons for Veteran Cyber Apprenticeships
California Advanced Lighting Controls Training Program (CALCTP)	Funded and documented by DOL as a best practice in 2011, CALCTP experimented with virtual and in-person training approaches, which contributed to 95% worker retention rates at 6 months.
Port of Los Angeles Apprenticeship	Developed apprenticeship positions based on "future of work" and built employer support for apprenticeship programs.
Labor gap assessment for the four California Investor Owned Utilities	Engaged employers to develop apprenticeship and pre-apprenticeship training programs and provide real-time feedback on the quality of the training.
Dislocated Worker Grant – US Virgin Islands	Maximizing employer demand for training and support through reverse referrals.
Online CalWORKs Appraisal Tool	Rapid, multi-audience project standup is not a barrier to achieving targeted outcomes: ICF stood up the 58-county tool in 3 months and an independent evaluation documented improvement in job placement and a 10% increase in wages.
Cybersecurity Youth Apprenticeship Initiative	Building registered apprenticeships in non-traditional sectors through building off industry credentials and skill-needs through a coordinated social marketing campaign.



ICF will build upon innovative apprenticeship models that allow TSMs to begin their apprenticeship prior to separation, such as the Veterans in Piping (VIP) apprenticeship program of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry (United Association). Before separation, TSMs participate in an 18-week accelerated training where they earn industry-recognized certifications from UA in heating, ventilation, air conditioning and refrigeration (HVAC-R); fire sprinkler fitting; and welding. The VIP program is offered at seven bases nationwide, including Ft. Hood in Texas and Naval Station Norfolk in Virginia. TSMs are released to participate in a civilian training assignment four days a week. On Fridays, they reconnect with their Units and attend to other transition priorities. After separation, TSMs move into 5-year apprenticeships operated through United Association local joint training committees in specific cities or regions.

We also draw on existing apprenticeship programs that bring veterans into the cybersecurity field, such as APEX Systems' Virginia Department of Labor and Industry-registered program. As an IT staffing firm, APEX is the employer of record while apprentices work at the client site. APEX pays for the training or certification to advance veterans' technical skills, and a client staff member serves as the apprenticeship mentor. Clearance from recent military service is a major facilitator to placing veterans in cybersecurity roles.

Next Steps

With the 2019 TAP Reset, DOL can now engage more deeply with TSMs, proactively supporting their job search through individualized counseling, tailored courses, and vocational training/apprenticeships. To deliver on the promise of veteran cyber apprenticeships, DOL needs a skilled consultant with knowledge of the principles of work-based learning and experience implementing DOL programs. Since 2000, ICF has held more than 100 contracts and subcontracts with DOL, including with VETS, the Employment and Training Administration, Women's Bureau, Bureau of International Labor Affairs, Occupational Safety and Health Administration, Office of Apprenticeship, Office of Disability Employment Policy, Chief Evaluation Office, and Mine Safety and Health Administration, so we thoroughly understand DOL policies, procedures, and preferences. ICF has been a partner in scaling strategic new DOL initiatives such as the HIRE Vets Medallion Award (winner of the 2019 Secretary's Honor Award). ICF is currently engaged in an evaluation of the impact of DOL Employment Workshops on veteran employment and wage outcomes. Our knowledge of the DOL TAP theory of change and key performance metrics means that veteran cyber apprenticeship program design and service delivery will be precisely aligned with VETS' mission.

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Mark Ouellette is the Director for Workforce Innovations and Commercial Markets at ICF and has more than 20 years of experience designing, improving, and evaluating the effectiveness of workforce training programs. For the past 11 years, Mr. Ouellette has designed and implemented the California Advanced Lighting Controls Training Program (CALCTP). This award-winning apprenticeship program includes various stakeholders from three California Investor-Owned Utilities (Southern California Edison, San Diego Gas and Electric, and Pacific Gas and Electric), California Energy Commission, California Public Utilities Commission (CPUC), and the Chancellor’s Office for the California Community College System and has trained more than 8,500 electricians and 950 electrical contractors in advanced lighting. Mr. Ouellette developed a Southern California Regional Apprenticeship Strategy and supporting the expansion of registered apprenticeship programs for youth. Mr. Ouellette is leading up an initiative to expand the number of young people enrolled in a cybersecurity registered apprenticeship program.



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