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EXAMPLES OF EXISTING CYBER APPRENTICESHIPS

Leigh Armistead, President

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EVERYBODY HAS THE SAME ISSUE

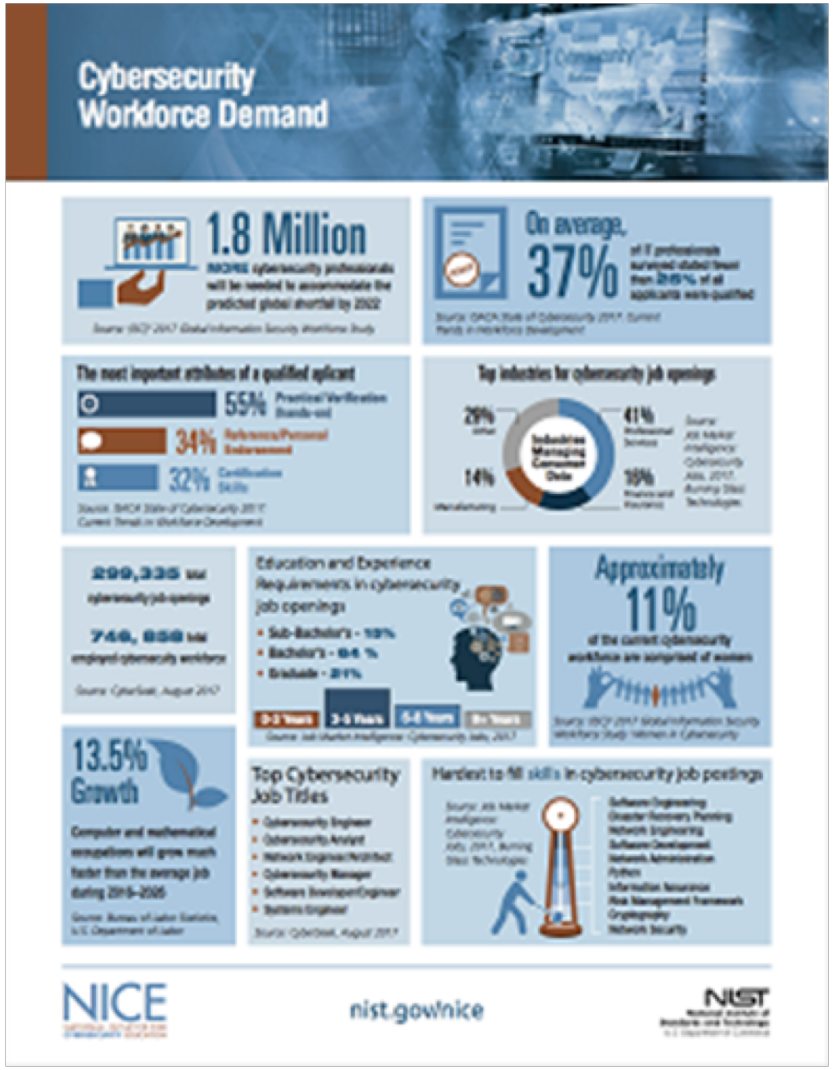
SOLVING THE CYBER SECURITY HIRING CRISIS. DHS AND THE GREAT TALENT SEARCH

NOW HIRING
APPLY WITHIN

SECURING OUR FUTURE: CLOSING THE CYBER TALENT GAP

We need a strong global cybersecurity workforce more than ever, but we are not doing enough to prepare young adults to be the next generation of cyber defenders and leaders. Young adults ages 18 to 26 from 12 countries told us:

THE RECRUITING PROBLEM



Shown is a NIST NICE One-Pager on the Cybersecurity Workforce Demand, with information that demonstrates the broad and sustained need for more trained and certified talent. In this document, they predict a 1.8 million global shortfall by 2022 (ISC2 2017 Global Information Security Workforce Study) with 285,681 cyber security job openings now (CyberSeek, August 2017) and fewer than 25% of the applicants were qualified with the most important attributes of applicants were hands-on experience (ISACA State of Cybersecurity 2017: Current Trends in Workforce Development). One can see there is a huge need for cyber security talent especially in the greater Washington, DC area to support the federal government.

THE RETENTION PROBLEM

Retention is a huge problem for cyber companies and this proposal resolves that issue by recruiting underrepresented populations in HUBZones. For example, in areas like the suburbs around Washington DC, job-hopping is not seen as bad, but it is tough on organizations, as they don't like training up recruits (such as apprentice program), only to see them leave quickly and go somewhere else. And because Cyber / IT jobs are so plentiful in these major metropolitan area, these employees can easily pick and move to a different organization. So as one can expect, to date, there has been reluctance by many organizations in NOVA and HR to invest heavily in dedicated cyber apprenticeships or internship programs, out of fear of losing the candidates, once they start getting offers from these other companies. This could be a win-win for apprenticeships in the Cyber realm, as it may give these corporations the incentive to invest in dedicated apprenticeship programs.

OVERVIEW

Peregrine Technical Solutions, LLC. (Peregrine) is a SBA certified 8(a), SB with core competencies in IT security, IA and cyber warfare. Headquartered in Yorktown, we have a number of cyber security contracts with the Navy, DoD and commercial organizations. Led by Dr Leigh Armistead, CISSP, a Hampton Roads native who is on the IT and Workforce boards at TCC, plus the Advisory Committee of Virginia Cyber Alliance. We have 330 Employees in all 50 states, DC, three territories, plus an academic cyber journal:
http://www.gbpts.com/solutions/cyberwar/research/journal

- ISO 9001:2013
- ISO 27001:2008
- CMMI Level 3 SW Dev

FIRST IN VIRGINIA (AND THE US)

Peregrine has been designated as the first corporation in the Commonwealth of Virginia for a registered Cyber Apprenticeship.
http://www.alexandrianews.org/2016/06/governor-mcauliffe-announces-expansion-of-cybersecurity-apprenticeships/

Recognized by the Governor for this distinction

We are also one of the first to have a similar registration at the federal level with the DoL. This is important because we need the Federal apprenticeship to operate in Juneau, AK

ADVANTAGES OF A CYBER APPRENTICESHIP OVER AN INTERNSHIP

Increased Net Income (Profit) by using apprentices on direct charge tasks

Discounted training costs as these new staff are registered with the Commonwealth – there are many types of savings that may be available depending on what grants are available to the community college.

There are also tax benefits available that DOLI and the community college can help the employer understand.

Increased retention and reduced turnover - apprenticeships have other financial incentive, which translates into recruiting costs.
https://www.doli.virginia.gov/apprenticeship/

A path to certifications, clearances a Common Access Card (CAC)..

#1 ISSUE WITH NEW HIRES SECURITY CLEARANCES

Driven by the billet. The employee must complete an Electronic Questionnaire for Investigations Processing (e-QIP), signature pages and submit fingerprints electronically for all initial investigation requests. Fingerprint results are valid for 120 days. PSMO-I review and processing As part of the Advanced National Agency Check process, Interim Secret and Interim Top-Secret clearances can only be granted based on the following criteria: Scheduled investigation, Favorable Review of the SF-86, Favorable fingerprint check, Proof of U.S. citizenship, Favorable Review of the Local Records, if applicable

PSMO-I will then make an interim determination. Once the request is accepted by the ISP, the investigation process begins. The current times for adjudication decision are shown here (but could be longer): SECRET - 38 days at Phase I (from the time clearance package via JPAS and review by PSMO-I for completeness) and 213 days at Phase II (from the time submitted to OPM process is completed). TOP SECRET - 62 days at Phase I (from the time clearance package via JPAS and review by PSMO-I for completeness) and 298 days at Phase II (from the time submitted to OPM process is completed)

CYBER APPRENTICESHIPS BENEFITS

Develop long-term relationships with employees who are committed to the company

Hire new staff and teach them new skillsets

Train them, invest in them and keep them current technically

Grow new candidates to meet our requirements

Use the registered apprenticeship as a model

Assuming success, expand to include more new hires

Update curriculum to meet changing standards from the DoD

Support other companies interested in cyber apprenticeships

SUMMARY

This effort is our attempt to solve some of the cyber staffing issues

Peregrine has worked very closely with TCC, TNCC and DOLI VA to develop these first cyber apprenticeship in the Nation

Continually update plan to match DoD / NIST workforce recommendations

Our staff can support other organizations to build their own registered model

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HOW EMPLOYERS IN THE NOVA REGION CAN START A CYBER APPRENTICESHIP PROGRAM

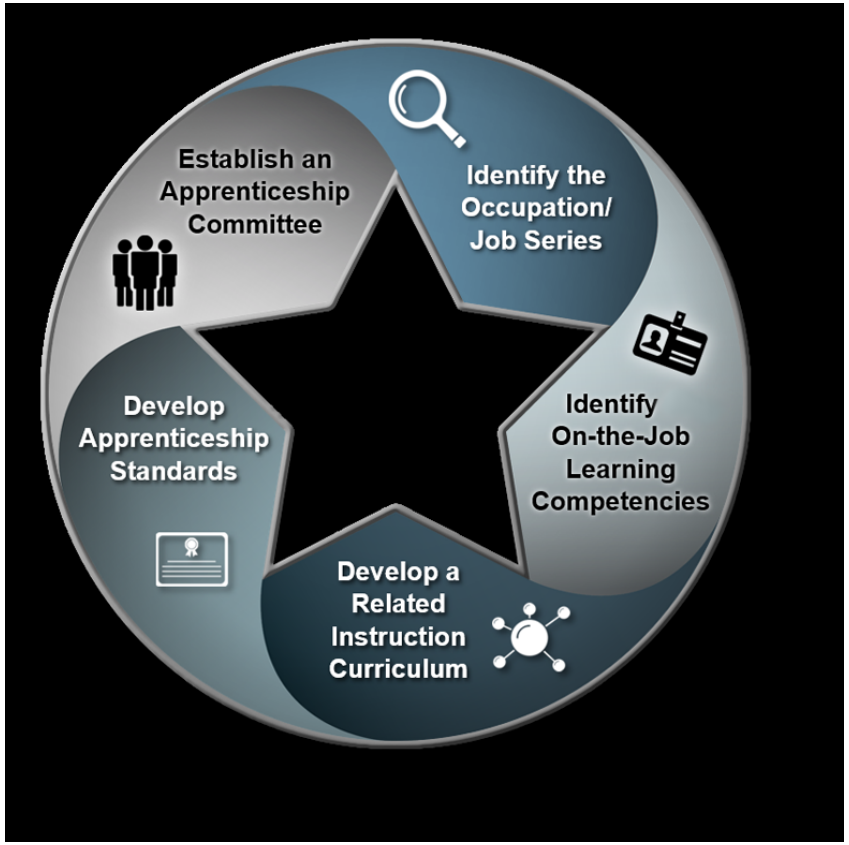
Leigh Armistead, President

DOLI'S APPROVED APPRENTICE PLAN

DOLI requires an approved apprentice plan that incorporates a number of processes to collect data that can be used to assess and improve the quality of a approved program to include: The competency-based approach measures skill acquisition through the individual apprentice's successful demonstration of acquired skills and knowledge, as verified by the program sponsor. Programs utilizing this approach must still require apprentices to complete an on-the-job learning component of registered apprenticeship. The program standards must address how on-the-job learning will be integrated into the program, describe competencies, and identify an appropriate means of testing and evaluation for such competencies. An outline of the work processes in which the apprentice will receive supervised work experience and training on the job and the allocation of the approximate amount of time to be spent in each major process. Periodic review and evaluation of the apprentice's performance on the job and in related instruction, and the maintenance of appropriate progress records. Evidence of ability to assure proper supervision, training, safety, and continuity of employment under the proposed ratio; Adequate and safe equipment and facilities for training and supervision, and safety training for apprentices on the job and in related instruction. Assurance of qualified training personnel and adequate supervision on the job. Program standards that utilize the competency-based or hybrid approach for progression through an apprenticeship and that choose to issue interim credentials, which must (i) clearly identify the interim credentials, (ii) demonstrate how these credentials link to the components of the apprenticeable occupation, and (iii) establish the process for assessing an individual apprentice's demonstration of competency associated with the particular interim credential. Further, interim credentials must only be issued for recognized components of an apprenticeable occupation, thereby linking interim credentials specifically to the knowledge, skills, and abilities associated with those components of the apprenticeable occupation. Recording and maintenance of all records concerning apprenticeship as may be required by the department or by law. https://law.lis.virginia.gov/admincode/title16/agency20/chapter21/section50/.

FIVE ELEMENTS OF AN APPRENTICESHIP

- Committee – TCC, DOLI VA and Peregrine
- Occupational Series – O*Net with three types
- OTJ Competencies – matched to DoD 8570 and 8140 regulations to become an IAT 1
- Instructional Curriculum – worked with TCC for 100% online courses that will give training to pass certifications
- Standards – utilized new VA O*Net rqmts



APPRENTICESHIP COMMITTEE

For most companies, the Apprentice Committee will consist of their senior leadership along with liaisons to their academic vendor (such as the Director of Apprenticeship at TCC) as well as the respective Department of Labor and Industry (DOLI) representatives in VA. As part of this proposal, VCCS plans to utilize Peregrine as a consultant to work with different corporations in starting their respective cyber apprentice program as well as the respective DOLI representatives. They will meet with the key stakeholders to suggest ways in which to start the establishment of committees at these different companies, where they can advise the C-suite on the roles and responsibilities involved.

IDENTIFYING THE OCCUPATION / JOB SERIES

All employers in the Commonwealth will use the already approved Information Security Analyst, O*NET Code (15-1122.00), for our occupation / job series. It was developed by the former Virginia Secretary of Technology (Karen Jackson) and is used by both DOLI and the federal DOL as well. Our recommendation is that other organizations and employers utilize it too, as it is straight-forward, competency based and covers a wide breadth of cyber security related fields, based with two categories:

- Level I - 2000 hours at a minimum for 12-18 months
- Level II – 4000 hours at a minimum for 24-30 months

OTJ LEARNING COMPETENCIES

The OTJ learning competencies are matched to the to the DoD 8570 and 8140 regulations to become an IAT 1 (Level I) or IAT 2 (Level II) as many of the prospective employers are DoD contractors. The VCCS team can work with companies interested in this model to educate them on these regulations and work with them to tailor their competencies.

RELATED INSTRUCTION CURRICULUM

The Commonwealth of Virginia is significantly ahead of other regions with two approved cyber apprenticeships both with Peregrine, utilizing Tidewater Community College (TCC) and Thomas Nelson Community College (TNCC). These plans will be available for prospective employers across the State, and all organizations can use these online courses to give the training to pass the following certifications:

- Level I – Four courses (ITN 101, 106, 107 and 109) to pass Comptia A+ test
- Level II – Eight Courses (The four Level I courses plus ITN 257, 260, 267 and 270) to pass the Comptia A+ and the Security + tests

STANDARDS

Information Security Analyst, O*NET – 15-1122.00, Competency Based with 2000 hours at a minimum for 12-18 months, with three specific categories at Level 1. The candidate will support tasks, and get a CAC and a SECRET clearance in this period.

- Cyber Security Analyst, Level 1- outcome is completion of one of the recommended industry certifications for Level 1: CAP, SSCP, Security+
- Computer Forensics Analyst, Level 1- outcome is completion of one of the recommended industry certifications for Level 1: EnCE, ACE, Certified Computer Examiner (CCE), or GIAC Certified Forensics Analyst (GCFA)
- Incident Response Analyst Cyber Security, Level 1- outcome is completion of one of the recommended industry certifications for Level 1: GIAC Certified Incident Handler (GCIH), EC-Council Certified Ethical Hacker (CEH), Certified Incident Handler (CIH)

TYPES AND STRUCTURES

The Apprenticeship Level I candidates focus on basic knowledge of HW/SW, with ITN-101 (Introduction to Network Concepts) a pre-requisite for most of the classes. Specifically, for an A+ certificate, two courses (ITN-106, Microcomputer Operating Systems and ITN-107, Personal Computer Hardware and Troubleshooting) are aligned with this particular examination plus ITN-109 (Internet and Network Foundation) are the four required courses for Level I.

The Apprenticeship Level II candidate curriculum consists of the following courses: ITN-257 (Cloud Computing: Infrastructure and Services), ITN-260 (Network Security Basics), ITN-267 (Legal Topics in Network Security) and ITN-270 (Advanced Linux Network Administration).

BEST PRACTICES

Peregrine has an already approved curriculum and DOLI programs, that can expedite the process of moving new candidates through the apprenticeship with expected outcomes to include a CAC, a SECRET clearance and the required DoD 8140 certification for IAT 1. To do this, it will incorporate best practices on developing apprentices to include https://www.americanprogress.org/issues/economy/reports/2014/09/25/97772/innovations-in-apprenticeship/. These case studies, focus on three important factors: A strong intermediary is key to a strong apprenticeship program, public investment, and industry-recognized credentials.

NOVA Regional Commission can serve in the role of the strong intermediary to coordinate between stakeholders, including employers, educational institutions, as well as the Virginia Department of Labor and Industry (DOLI). They will conduct outreach to employers and provide the technical assistance necessary to help employers establish a functional apprenticeship program. Secondly, this plan will ensure that all employers understand what public dollars can be leveraged to offset private investment in worker training. While employer tax credit does not fully cover the costs of sponsoring an apprentice, it does serve as a vital marketing tool that brings employers to the table, plus the community colleges often offer discounted course as well for apprentices. Finally, by incorporating DoD recognized credentials (DoD 8570/8140) into an apprenticeship program ensures that workers who complete their apprenticeship gain a credential that is nationally recognized and truly portable, plus it strengthens the currency of apprenticeships.