Closing the Gap: A Department of Defense (DoD) Conference on Re-entry for Women Veterans into Cybersecurity Careers

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Abstract

The cybersecurity workplace continues to show an imbalance based on gender, with 20-25% ratios of women to total workforce being the norm rather than the exception. In order to create pathways to bridge this gap, the authors organized a virtual conference focused on women veterans. This invitation-only conference assembled leadership from research institutions, organizations that employ cyber talent, government officials, and female military veterans. Three dimensions were used to focus the discussion: the impact of gender on job, the differences between military and civilian work environments, and the complexity of pathways to cybersecurity content. The conference concluded with multiple recommendations to improve opportunities for women veterans entering the cybersecurity workforce.

This paper describes the activities and results of a George Washington University DoD Cyber Scholarship Program (CySP) capacity building project during the 2020-2021 academic year. In particular, the report provides information about the conference held on **"Closing the Gap: Re-entry of Women Veterans into Cybersecurity Careers."**

Project Description

"Closing the Gap: A DoD Conference on Re-entry for Women Veterans into Cybersecurity Careers" addressed the crucial need to fill the exponentially growing cybersecurity gap (whether it is a talent gap of skilled cybersecurity workers or a gap in the time between jobs in the military and the cyber-workforce), as well as to address the gender imbalance in the field. For the United States to remain a world leader in various fields of science and technology, a robust and educated cyber-workforce is required. The conference was designed as a one-day conference with pre-conference briefing booklets for the participants and exploratory background white papers and post-conference findings and publications—including a social media campaign. The briefing booklets and one-day conference addressed three broad issues related to women and women veterans who might consider reentering the workforce in one or more of many cybersecurity areas: the *gender* issue, the *transition* from military to civilian workforce, and the substance of cybersecurity *education* itself.

Project Innovation: Why is there a need for a focused conference?

In a series written for The Atlantic, Maples (2017) noted "I happen to be a woman. This is often inconvenient. It was inconvenient for the military and, now that I'm out of the military, it's still inconvenient." In multiple surveys and anecdotes, both women who are serving and women who

have served repeatedly list gender bias as an issue, though the way it manifests itself differs during and after their time in the military.

Women are the fastest-growing segment of the veteran population—about 10 percent of the nation's 21.5 million veterans are women. Adding to that number are the military partners. Yet, the inequities in hiring, pay, and advances continue. What advantages can women leverage as they pursue their paths forward to meaningful and rewarding employment? What are the challenges and obstacles to be overcome? What are the current best practices to build on the advantages and negate the challenges?

Many educators and researchers have identified issues related to women veterans' reentry to the workforce and the special issues related to veterans (Syracuse, 2020; George, 2016). A survey of recent conferences and workshops hosted by professional societies reveals that while the topic of reentry may appear in a session, with or without a panel discussion, these researchers found no focused conference hosted by professional cybersecurity and/or other science, technology, engineering, mathematics, or medical science (STEMM) societies or organizations. For example, neither all-day conferences such as the National Academy of Science event or the White House session on reentry (OSTP, 2014) focus on issues of cybersecurity or the woman veteran.

Being available to enter the workforce is not the same as being ready or equipped with the understanding of issues, challenges, barriers, or strategies to reentry. Surveys by the Student Veterans of America (SVA) report the number of veterans pursuing and reporting interest in pursuing degrees in STEMM fields is higher than the rate of those graduating. Additionally, veterans are a trusted resource, with security clearances and the notion that "protect and defend" is the reason they joined the military. There are opportunities before, during, and after transition from the military and during recruitment and enrollment in college to impact the choices of women veterans and bring them to opportunities in cybersecurity. Researchers note (Weisberg et al, 2011) that women are said to be empathetic, agreeable, conscientious, "open," and orderly. Additionally, the characteristics of military veterans—persistence, reliability, conscientiousness, and attention to detail—are linked to enhanced job performance and academic achievement.

Technical skills are not the only ones in demand in cybersecurity. Deidre Diamond, CEO of a cyber-staffing company, noted that communication, problem-solving and the ability to work in teams are crucial to cybersecurity careers. Curiosity, analytical thinking, and adaptability are among the numerous ***soft skills*** non-technical people bring to cybersecurity. While technical skills are, of course, important and cybersecurity professionals need to know the tools of the trade and the latest threats, non-technical skills also play a role in stopping hackers and securing networks. In addition, no matter how technically capable employees are, it is critical that they function well within a team environment—since most security outcomes are accomplished by teams of experts, with everyone contributing their unique expertise. Diversity in team composition is an advantage when defending against adversarial attacks; the style and processes used by women challenged in problem solving vary significantly from those used by males (Merchant, 2012). Thus, teams that are diverse create a more secure environment than do uniform, male-dominated teams; an environment that is more difficult to breach.

It is important that women highlight their strengths and draw linkages from these strengths to the goals and careers they are pursuing. Women's problem-solving skills and attention to detail relate to the nature of jobs within cybersecurity (Buckley, 2019). In addition, collaboration is a skill that is better aligned to female traits (Cullinan, 2018), thus increasing the strength of their contributions in cyber security teams.

Typical Current Observations and Efforts Towards Women Veterans in Cybersecurity

A 2017 Frost and Sullivan study on workforce capacity in cybersecurity found that at least 57% of respondents noted that delayed advancement was a challenge for women. Prior longevity within positions may also be a factor for dismissing potential candidates. Some women veterans, who also are military spouses, may face additional barriers to employment, including frequent relocation and increased family duties during a spouse's deployment.

Specifically, as relates to the cybersecurity field, Peacock and Irons (2017) attribute the challenge for women seeking cybersecurity jobs to the fact that computer security is perceived by customers, clients and society as a whole as a "man's job." Once hired, some women experience a hostile work environment and unconscious bias in the male-dominated field of cybersecurity.

In addition to the general contexts in which women experience bias or inequity, academia represents its own challenges. Women veterans report isolation and/or invisibility, even at veteran student events. In her doctoral thesis, Carvajal (2017) noted that "Because their experiences are so different from those of their classmates…female veterans often complain of isolation in college."

Starting salary negotiation can significantly affect an employee's wages. According to the U.S. Bureau of Labor Statistics (BLS), women earn 80.3% of what men earn, independent of women's choices to choose lower paying careers. Women employees' wages are generally lower than those of male employees because males are more likely to negotiate. A Lipman study (2019) found that men are four times more likely to ask for a raise. The study also found that women who ask for raises do so 30% less than men. Artz et al (2018) reported that women who asked for raises received them 15% of the time. On the other hand, men who asked for raises received them 20% of the time.

"Closing the Gap" Project Methodology

In preparing for the implementation of the "Closing the Gap" conference, the following methodology was followed:

- Organize based on a framework of three major aspects: (1) Women Veterans' Challenges, (2) Moving from a Military Life to a Civilian Life, (3) Women Veterans: New Cybersecurity Skills.
- Identify and install an advisory committee.
- Design and implement a video introducing the challenges and opportunities U.S. women veterans face as they transition from military to civilian life.

- Create a website to track the project progress and serve as a repository of all materials—including a "Resource Guide" with references and action steps.
- Prepare briefing papers citing established research and background on reentry of women veterans into cybersecurity, with additional material drawn from the research on women in STEMM.
- Assemble experts in the field focused on their personal assessment of why the gap still exists and what they might do differently hearing from the other experts in the room.
- Explicitly include gender-based approaches to establish a network of professionals and academics, as well as to hone specific strategies for the implementation of a reentry plan for women veterans.
- Conduct a one-day working conference combining pre-conference briefing booklets, conference presentations, presentation panels, and breakout discussions.
- Issue post-conference publications on presentations and findings, as well as an ongoing social media campaign.
- Regularly update the "Resource Guide" to allow participants to clarify and strengthen the material upon reflection.
- Prepare an edited video condensing the perceptions and experiences of six female veterans discussing their challenges and opportunities in transitioning to cybersecurity careers
- Produce a printable, digital version of the final report kept on the website for the Center for Women in Engineering

The conference itself was held over a single day (May 25, 2021) virtually and attracted 85 participants. The Zoom platform was utilized with three pre-conference papers written and circulated ahead of time to establish a common departure point and stimulate ideas in three key areas: gender issues in career development, transition from military to civilian workforce, and cybersecurity educational requirements.

During the event, "Fireside Chats" brought leading-edge experts in front of participants to prompt informal dialog addressing issues of acceptance and dissemination. Following each fireside chat, breakout rooms encouraged direct idea capture and submission using the Google Docs platform. Each breakout room utilized a shared document that provided previously created questions and conversation starters for each participant to formulate, discuss, and record their responding ideas. Following their discussion, each breakout leader provided a report-out to the conference at large.

To conclude, a wrap-up session enabled the development of action agendas that built on the day-long contributions and discussions and shaped strategies that were supported by all participants.

These diverse elements across several media platforms are shown in Figure 1.
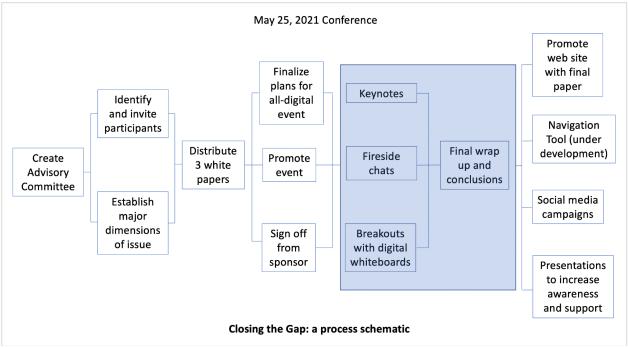
May 25, 2021 Conference

Create Advisory Committee → Identify and invite participants / Establish major dimensions of issue → Distribute 3 white papers → Finalize plans for all-digital event / Promote event / Sign off from sponsor → Keynotes / Fireside chats / Breakouts with digital whiteboards → Final wrap up and conclusions → Promote web site with final paper / Navigation Tool (under development) / Social media campaigns / Presentations to increase awareness and support

Closing the Gap: a process schematic

Figure 1: "Closing the Gap" Process Schematic

Outcomes

The conference, as noted through anecdotes and responses in the conference chat by all who attended, was a great success. More than 80 participants of varying occupational distribution joined the discussion throughout the day. By profession, attendees comprised: 13 academics, 10 government employees, 18 industry representatives, 3 members of the military and 11 veterans, 9 members of various non-profit organizations, 4 researchers, and 12 individuals who noted themselves as "other". Of equal importance is the distribution of participants by gender: 59 females, 14 males, and 7 who either chose not to identify or whose responses were incomplete. The distribution of participants by gender and profession is displayed in Figures 2 and 3 below.
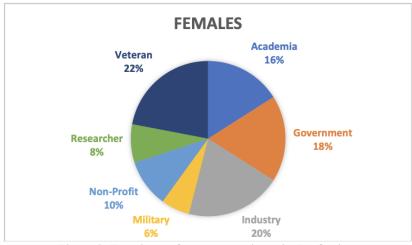

FEMALES

Veteran 22%
Academia 16%
Government 18%
Industry 20%
Military 6%
Non-Profit 10%
Researcher 8%
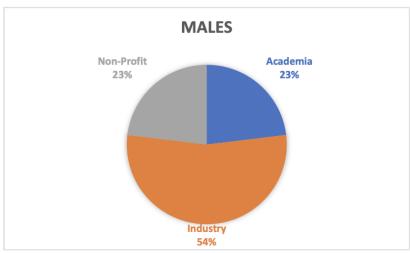
Figure 2: Female Conference Attendance by Profession

Figure 3: Male Conference Attendance by Profession

Key Observations

The major national initiatives suggested by the presentations and discussions during the day can be considered as efforts toward creating an active support network of individuals committed to making a difference. The conference emphasized the need and opportunity for a cross-community effort that includes strong representation from the various stakeholder groups: academia, government including military, industry, and private non-profit interest groups.

The conference focused on women veterans and the following observations were made with women veterans in mind. Many of the issues can be extrapolated to include veterans and non-veterans, as well as men and women.

- **The value that women veterans bring to the table is not promoted by the women, and not understood by the recruiter/employer.**

An apt comment by one panelist framed this notion well, as pertaining to the value of women veterans: "Women vets are by nature problem solvers." Participants noted that help is needed for women veterans—e.g. resume workshops in understanding the soft skills that translate well to cybersecurity. Soft skills, which are often a hallmark of military life, include adaptability, flexibility, critical thinking, problem-solving, action-orientation, crisis management, previous exposure to other cultures and languages and travel (if deployed), and building high-performance environments with diverse groups. These skills may not be recognized in traditional job interviews where coursework grades and formal study may be assumed to be the sole indicators for job readiness.

- **The transition phase needs to be pre-transition, during transition and post-transition.**

While women veterans should build on their opportunities to network and find mentors from two years prior to their transition, the military needs to encourage that network-building and enable 'pinball' networking, where one can ask, "Who do you know?" and "Who do they know?" and

so on. The need for mentors does not end. They should seek out mentors for different purposes, a sort of board of directors.

Employers need to be more flexible in how they craft job descriptions—do they really need 3-5 years of experience? Do they really need specific degrees? Can candidates learn on the job? Employers should offer mentoring and reach out even before employment starts. There should be mid-level career opportunities so women veterans with skills don't necessarily have to begin in entry-level positions. Accommodations should be made for women veterans' issues—for post-traumatic stress disorder (PTSD), military sexual trauma (MST), responsibility to care for children/elderly, etc.

- **A wealth of information and resources is available to help women veterans, but it is stove-piped, overwhelming and intimidating, and needs to be consolidated on an ease-of-use platform or made more accessible through intelligent search applications. It should not be a one-size-fits-all solution, but rather depends on the situation.**

There are many stove piped efforts, but an effort needs to be made to evaluate the current resources—how well they are working, and how suitable they are to the cybersecurity field.

As noted in the open literature and by many conference attendees, there are many resources already prepared for veterans, but they are disjointed, poorly coordinated, and often siloed. A representative sample of these resources can be found at the conference website (Closing the Gap, 2021a). The Federal government needs to take the lead in creating a consolidated platform for the many resources available. Such a platform would include resources, a roadmap, and guidance for the specific career path. There needs to be better collaboration among industry, higher education, apprenticeship programs, federal agencies, and human resources professionals to address the stovepipes. An effort needs to be made to evaluate the current resources, how well they are working, and how suitable they are to the cybersecurity field.

In addition, while the title of the conference suggested an interest in women veterans, it was made clear by the discussions that spouses of veterans should also be included in all discussions and future efforts. After all, the "trailing spouse" speaks both languages—civilian and military. Attendees also urged that opportunities be addressed for disabled veterans, as well as military spouses, and non-traditional workers, such as remote working opportunities.

Conference Recommendations

Key recommendations that emerged included the following:

- Support the creation of an active network of individuals committed to making a difference in the various disciplines assembled during the "Closing the Gap" conference.
- Establish annual reporting of statistics to show progress toward the goal of increasing the number of female veterans entering the cybersecurity profession.
- Launch and maintain a clearinghouse of resources and a navigation tool for analysis and research.

- Call for a research network of universities and research centers to carry on this work.

Dissemination Strategies

At the end of the Conference, a decision was made to further the dissemination of results and the search for implementation partners through an aggressive social media campaign spanning the forefront social media platforms in use today. The "Closing the Gap" social media campaign includes a #GWCloseTheGap initiative for the following platforms:

- Facebook: *@GW.ClosingTheGap*
- Twitter and Instagram: *@GWCloseTheGap*
- LinkedIn Group: *@GW Closing the Gap Women Vets in Cybersecurity*

One of the major products of the "Close the Gap" initiative is a six-minute video "Closing the Gap: Women Veterans' Re-entry into Cybersecurity." (Closing the Gap, 2021b) The video is composed of six interviews with women veterans of all ranks and experiences. The video presents a unique opportunity to introduce the issues that women veterans face in moving into cybersecurity to those who are unfamiliar with the topic. Additionally, because it personifies the problem through six individual experiences, the video is a tool for those seeking a way to dramatize the issue to a broad audience with the purpose of changing practice and/or policy.

In addition, the "Closing the Gap" website (Closing the Gap, 2021a) is the repository of all materials related to the conference, including but not limited to links to: the full conference agenda, useful resources related to the initiative (including three white papers: "Women in Cybersecurity," "Challenges and Opportunities in Transition from Military to Civilian Life," and "Cybersecurity Pathways"), and the video materials.

The Department of Defense has provided support for the "Closing the Gap" initiative to address the growing demand for cybersecurity professionals and abundance of highly skilled women veterans by aiding the implementation of a pathway to introduce women veterans in cybersecurity roles.

Conclusion

Our project provides insights into a complex system of the demand for skilled workers and the supply of women veterans. Because of the breadth of stakeholders, connecting the supply and demand is made difficult due to a lack of coordination and coherence. In order to maximize the reach and audience of our initiative, we hosted a virtual conference utilizing Zoom technology. The key recommendations of the conference revolved around strengthening processes and improving access to, and content of, learning resources. In addition, it was made clear by the discussions that spouses of veterans should also be included in all discussions and future efforts. Necessary and viable strategies include linking existing institutions in order to take advantage of synergies, creating resource banks and navigation tools to help point interested career seekers to the right place, and establishing a national statistical database showing progress towards gender balance in the cybersecurity profession. The creation and ongoing deployment of an aggressive social media campaign addresses the sustainability of these strategies. Current efforts are

dedicated to the implementation of a navigational tool that will allow active military personnel to parse the multitude of information and select those resources that relate to their personal situation. In addition, we continue to discuss networking opportunities with universities and research centers.

Acknowledgements

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