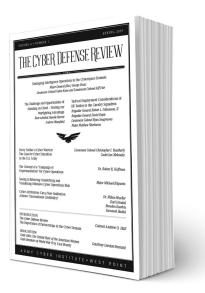*The Cyber Defense Review:*
The Importance of Partnerships
in the Cyber Domain

Colonel Andrew O. Hall

INTRODUCTION

Welcome to another provocative edition of the CDR, which explores the importance of partnerships in the cyber environment. Crucial to the success and growth of the Army Cyber Institute (ACI) is the development of impactful partnerships. We are most proud of our special relationship and partnership with the NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE) in Tallinn, Estonia. The NATO CCDCOE is a global thought leader in the discussion and advancement of critical cyber issues–technology, strategy, operations, and law. Each year NATO CCDCOE hosts their prestigious International Conference on Cyber Conflict (CyCon) in Tallinn. This year's CyCon conference theme of "Silent Battle" seeks to foster a conversation on topics such as vulnerabilities, exploitations and patches, threat detection and attribution, and situational awareness to wage this 'silent battle.' The ACI will support this magnificent event with speakers, West Point cadet participation, and distribution of the Spring CDR to all attendees. We at the ACI believe that operational success in the cyber domain derives from the development and evolution of strategic partnerships. We are excited that the CDR facilitates impactful partnerships and is at the fulcrum of the global cyber conversation.

I am continually impressed with the quality of our CDR contributors as they push the envelope regarding the scope of their research and analysis. Our Spring issue opens with an article from Rear Adm. Danelle Barrett and Mr. Andrew Mansfield that addresses the reality and potential of cloud computing in the Navy and DoD. The ACI is experimenting with the renewed tactical applications of HF communications, partnering with conventional and SOF units during their rotations at the U.S. Army National Training Center and Joint Readiness Training Center. An outgrowth of this critical work is the collaborative article from BG Robert L. Edmonson, BG David Doyle, LTC Ryan Seagreaves, and MAJ Matthew Sherburne that unmask some of the tactical employment considerations and misconceptions of HF communications. Our Leadership Perspective section concludes with an exciting article from

Colonel Andrew O. Hall is the Director of the Army Cyber Institute where he directs and oversees research, leader development and partnership efforts in the cyber domain. He studied Computer Science at West Point, Applied Mathematics at the Naval Postgraduate School, and Operations Research at the Robert H. Smith School of Business at the University of Maryland. He has served in infantry and artillery units and on the Army Staff and the Joint Staff.

MG (Ret) George Franz, LTC Galen Kane, and LTC Jeff Fair that focuses on the reshaping of cyber intelligence operations to combat new challenges and find opportunities for success on the silent battlefield. We also feature a multi-dimensional Professional Commentary from returning CDR author Oz Sultan, Chief Strategist at Sultan Interactive Group, where he examines disinformation and the growing danger of online terrorism.

Diving into the deep end of our Research section, the CDR features four well-crafted and articulated works that provide our readership with a fresh perspective on cyber partnerships. LTC Christopher Heatherly and Cadet Ian Melendez (Army ROTC at Washington State University) argue that through a new and improved cyber education program, the U.S. Army could expand its cyber reach to all Soldiers. In the next research article, Dr. Robert R. Hoffman introduces readers to the concept of a 'Campaign of Experimentation' for cyber operations. This thought-provoking piece explores new concepts to enhance offensive and defensive cyber operations. MAJ Michael Klipstein from the ACI guides readers in an understanding of the quantification and visualization of offensive cyber operations risk. This research effort asserts that a quantifiable framework could mitigate the lack of national-level expertise for offensive cyber operations. The research section concludes with an engaging article from Dr. Milton Mueller, Karl Grindal, Brenden Kuerbis, and Farzaneh Badiei as they delve into the legal aspects of institutionalizing a transnational cyber attribution policy.

We continue our tradition of providing high-impact Research Notes to our readers with an article from COL Stoney Trent, Dr. Robert R. Hoffman, LTC David Merritt, and CPT Sarah Smith, as they model the cognitive work of cyber protection teams. To complete this edition of the CDR, we are thrilled to introduce you to the ACI's staff lawyer, Courtney Gordon-Tennant. In Courtney's review of *Code Girls: The Untold Story of the American Women Code Breakers of World War II*, by Liza Mundy, we learn about the tremendous accomplishments of American female codebreakers during the early days of cyber.

As we discussed in the Fall issue, the CDR and ACI are continuing the cyber conversation with the establishment of the CDR Press. Our inaugural CDR Press publication is entitled *Nonsimplicity, The Warrior's Way* by Dr. Bruce West and Dr. Chris Arney. This important work explores complexity science and suggests appropriate changes in policies, procedures, and principles are needed in the U.S. military; specifically, addressing the implications to the individual as these changes are made.

In becoming the journal of choice for cyber practitioners and to further push the conversation, we are excited to announce the introduction of a SIPR-based CDR. This will be a space where rich cyber conversation can take place in a meaningful and impactful manner. With this new avenue for discussion, we are seeking SIPR accessible researchers to submit articles, blogs, white papers, briefings, and research notes. Our featured blogs will allow the conversation to continue informally and in a free-flowing manner. These new projects will allow cyber practitioners the opportunity to publish innovative and thought-provoking works. As always, these two endeavors are in keeping with the ACI and CDR's tradition of advancing the body of knowledge. There will be further updates to come regarding the SIPR CDR, but for now, as General Douglas MacArthur once said, "keep your ear to the ground."

Along with the establishment of the CDR Press and the new SIPR CDR, we are partnering with the Palo Alto Networks' Cybersecurity Canon to establish new standards and format for our CDR book reviews. The Cybersecurity Canon has a laser-focus on education and highlights must-read books for all cybersecurity practitioners. This well-thought-out book review format can be viewed at https://cybercanon.paloaltonetworks.com and will ensure the quality of reviews is consistent across the CDR's cyber conversation.

Our theme of partnerships extends to the CDR Editorial Board. This world-class group of scholars exemplifies the importance of partnerships as they collectively transform the CDR. At our inaugural Board meeting at the CyCon U.S. Conference in Washington DC last November, members provided recommendations to improve quality and reach, which will increase CDR standing and product. Our members agreed the CDR's 'sweet-spot' regarding content is to tackle the Big Issues. We had a lively discussion among all Board members regarding the potential benefit of themed or area issues with suggested topics: 1. Information Warfare, 2. Law & Policy, 3. Military Leadership in the Cyber Domain, and 4. Cyber Conflict. Board members suggested the CDR participate in major cyber conferences to increase exposure and endorsed greater international focus for CDR articles and authors. The CDR was encouraged to develop global partnerships with cyber stakeholders. All Board members volunteered to act as Ambassadors for the CDR and assist with attracting new authors. I look forward to our second meeting, which will be held in September, here, at the United States Military Academy at West Point.

I want to thank Michelle Marie Wallace, Sergio Analco, Gina Daschbach, SGM Jeff Morris, Courtney Gordon-Tennant, and Tony Rosa for their exceptional contributions to this edition. Their talent, creativity, and tireless effort are instrumental in the CDR's success. As always, we are excited to continue the cyber conversation together.