



2015 - 2016 ANNUAL REPORT

NATIONAL CYBERWATCH CENTER



NATIONAL
CYBERWATCH
CENTER

www.nationalcyberwatch.org

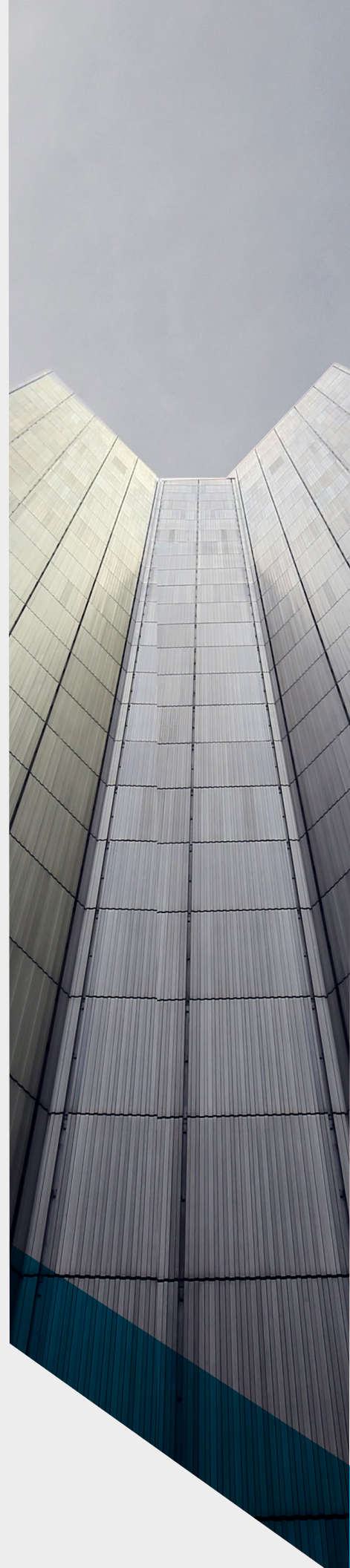
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About National CyberWatch Center

National CyberWatch Center (NCC) is a National Science Foundation Advanced Technological Education-funded cybersecurity consortium working to advance cybersecurity education and strengthen the national workforce. Since 2005, National CyberWatch Center has played a key role in developing, promoting and providing cybersecurity education solutions nationally.

To learn more, visit www.nationalcyberwatch.org.



EXECUTIVE DIRECTOR'S MESSAGE



Dear Colleagues,

The National CyberWatch Center (NCC) builds on a 10-year foundation of success, as evidenced by significant national impact in cybersecurity education. NCC has established and validated national and federal education and training standards; created a new annual conference, the Community College Cyber Summit (3CS), focused on cybersecurity education at the community college level; validated industry-backed cybersecurity skills using performance-based assessments, which are scalable across many industry certifications, curricula, jobs, and verticals; and built and updated new hands-on cybersecurity curricula tied to job roles and industry certifications. These are just a few of the Center's more notable successes.

NCC advances its work on multiple fronts as the "go-to organization" for innovative, scalable and cost-effective cybersecurity education and workforce development partnerships and solutions. Funded since 2005 through the National Science Foundation (NSF)'s Advanced Technological Education (ATE) program, NCC is now in its fourth year of funding as the national center for cybersecurity education.

NCC continues building on its culture of collaboration by coordinating and partnering with a broad national network, including academic institutions and public and private sector organizations; promoting and growing models of

impact in technical programs, student capabilities and career pathways; and advancing research, evaluation and assessment in cybersecurity education.

Our academic member network continues to grow with 200 higher education institutions in 47 states and the District of Columbia. In addition, NCC continues to engage and foster powerful business collaborations, as evidenced by ongoing support from Facebook, Northrop Grumman, National Security Agency (NSA), Johns Hopkins University Applied Physics Lab, NSF, and the Department of Homeland Security (DHS).

NCC continues to expand its work across various sectors, validating the notion of Cybersecurity Everywhere. These collaborative efforts included work on Wall Street, critical infrastructure and national defense.

These successes would not have been possible without our academic member institutions, faculty, students, industry and government partners, the senior leadership team at Prince George's Community College (PGCC), and the dedicated NCC Executive and Program Management teams. We also are grateful to our Industry Support members, our NSF program officers—Dr. Corby Hovis and Dr. Victor Piotrowski—and our National Visiting Committee (NVC) members.

Advocating, building, collaborating, and coordinating scalable and cost-effective models of impact and solutions to some of our country's most vexing information security challenges remain at the core of what NCC does.

With an eye toward the future and our mission, you can expect the same high-quality work associated with NCC to impact our future years as we lead collaborative efforts to advance information security education and strengthen the national cybersecurity workforce.

Best regards,

A handwritten signature in blue ink, appearing to read "Casey W. O'Brien". The signature is stylized and fluid.

Casey W. O'Brien
Executive Director & Principal Investigator



MAJOR EFFORTS

In the past year, attention on cybersecurity has increased as evidenced by the daily barrage of breaches to both public and private sector organizations, the continued shortage of qualified technicians and increased awareness of risks in the board and C-level suites.

A growing portion of this attention is focused on cybersecurity education, specifically the role community colleges play in solving some of the nation's information security challenges. NCC continues to build on and share effective practices; eliminate duplication of effort; and coordinate, standardize and proselytize various educational and training initiatives showing tremendous promise as viable solutions to ever-important workforce challenges. NCC ensures that the community college "voice" is heard in the national dialogue, the pathways between two-year and four-year tracks are aligned, curriculum standards now being shaped have strong community college input, and the student pipeline is filled and workforce shortages are abated.



The Voice of Community College Cybersecurity Education

NCC is intimately engaged in ongoing national conversations concerning the future of cybersecurity education, representing the community college voice and often chairing community college committee or K-12 special interest groups. NCC is recognized as a national spokesperson by industry, the certification and accreditation communities, as well as the press.

Examples:

- National Institute of Standards and Technology (NIST)-led National Initiative for Cybersecurity Education (NICE):
 - Collegiate Working Group
 - Co-Chair, Casey O'Brien
 - Co-Chair, Dr. Barbara Endicott-Popovsky
 - Career Development & Workforce Planning Co-Chairs:
 - Co-Chair, Dr. Margaret Leary
 - Co-Chair, Dr. Jo Portillo
 - Participating Member, Lewis Lightner
- Colloquium for Information Systems Security Education (CISSE) Community College Panel Chair:
 - Chair, Dr. Vera Zdravkovich
 - Participating Member, Lewis Lightner
- New Cooperative (Co-Op) Education pilot with the NSA. The pilot will focus on Maryland community college students in the second semester of their first year whose studies are part of a cybersecurity program. The NSA currently has a healthy Co-Op Program, dating back 60 years, which focuses on four-year institutions and targets qualified second semester freshmen and sophomores majoring in Computer Science, Computer Engineering or Electrical Engineering. The NSA would like to expand the qualified majors to a cyber track of study and open it up to community college students who plan to pursue a four-year degree.

EXPANDED COLLABORATION

One of the roles of the NCC is to collaborate with educational institutions, businesses, government entities, and professional organizations to strengthen cybersecurity education and research programs. This work continued in earnest as evidenced by the following activities:

- Led by NCC, all five ATE Cybersecurity/Forensics centers—Advanced Cyberforensics Education, CyberWatch West, Center for Systems Security and Information Assurance, and Cyber Security Education Consortium, as well as the Broadening Advanced Technological Education Connections and the Mid-Pacific Information and Communications Technology centers—co-produced the 2015 3CS
- NCC co-sponsored a special issue in the National Cybersecurity Institute Journal (NCIJ) on the role of community colleges in cybersecurity education (<http://ncij.excelsior.edu/volume-2-no-2>). The issue includes six articles on this topic, including one with several NCC team members as co-authors
- NCC, along with CyberWatch West, the Center for Systems Security and Information Assurance, the Mid-Pacific Information and Communications Technologies Center, and the Cyber Security, Privacy and Research Institute at George Washington University continue to plan, implement and grow all National Cyber League (NCL) activities

SUPPORT AT THE STATE LEVEL

The 2015 Commonwealth Conference on Cyber and Education brought together government, private sector and educational representatives for candid discussions on opportunities and strategies for filling the cyber talent pipeline.

The day-long event also provided insight on emerging cyber trends and provided opportunities for networking and one-on-one conversations with Virginia's leading cyber schools.



“On behalf of my Administration, I would like to offer my sincere thanks for the investment of your time, energy, and expertise that made the inaugural Commonwealth Conference on Cyber and Education a complete success.” Terence R. McAuliffe, Governor, Commonwealth of Virginia

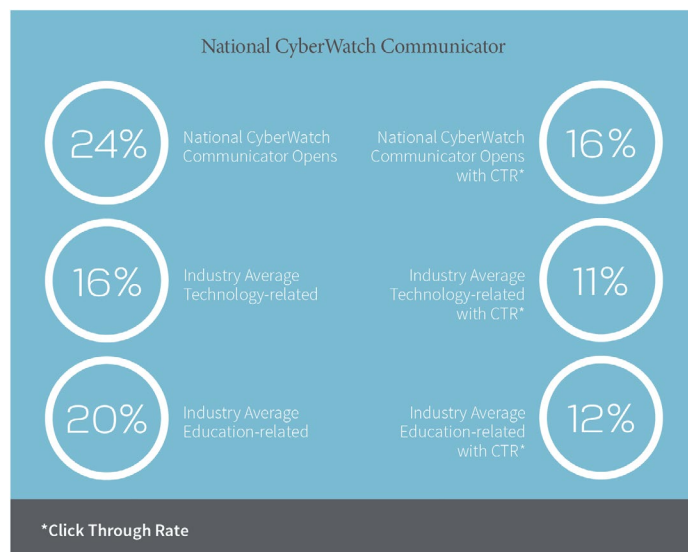
MARKETING & COMMUNICATION

NCC’s mature, data-driven and integrated communications and social media platform includes regular communications to the NCC community (monthly e-newsletter, the NCC Communicator), social media software that allows for the easy distribution of content across the NCC’s various platforms, the tracking, reporting and usage of these systems, and the dissemination of media releases promoting NCC projects, events, member institutions, and subject matter experts.

NCC’s marketing and communication efforts made significant impacts in the past year, as evidenced by various metrics (above-industry open and click-through rates for the NCC monthly NCC Communicator, high numbers of headline impressions and media pickups for various media releases, and increased numbers of followers on Twitter, Facebook and the NCC YouTube channel.

STATISTICS

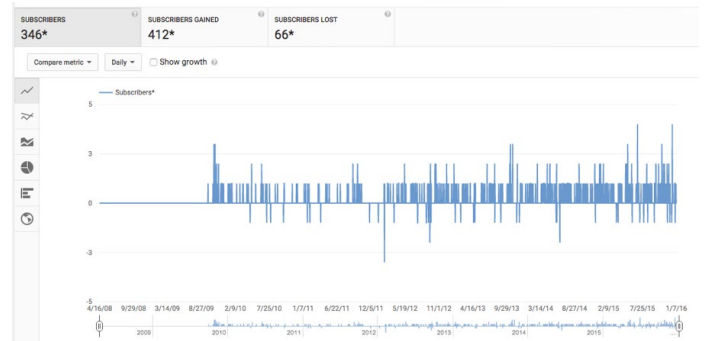
NCC COMMUNICATOR



FACEBOOK:



YOUTUBE



TWITTER:

Month	Tweets	Profile visits	New followers	Tweet impressions	Mentions
April	21	249	10	4,517	7
May	42	172	N/A	8,319	N/A
June	39	176	7	5,200	2
July	22	140	7	4,741	N/A
August	35	173	8	4,984	3
September	33	180	12	5,234	2
October	62	212	15	8,155	9
November	39	99	15	7,551	3 mention/7 linking us
December	24	155	4	7,847	1 mention/8 linking us

PROMOTION, **PROMOTION**

NCC continues to promote educational and workforce development models of impact, as well as member institutions' programs of study, faculty, students, and various events. In addition, NCC created a one-page flyer and dedicated email, promote@nationalcyberwatch.org, to encourage member institutions to leverage NCC's reach and marketing success.

NATIONAL CYBERWATCH CENTER **PROMOTIONS**

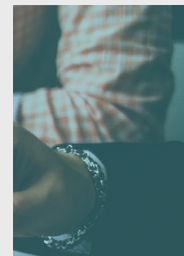
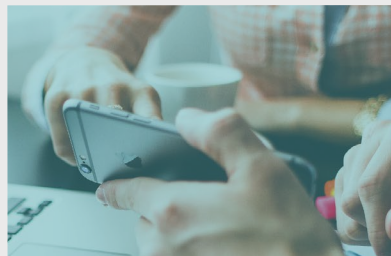
Let the National CyberWatch Center promote your cybersecurity-related programs, events, and news-worthy items to a national audience of educators, students, industry partners, professional associations, and government organizations. Examples include: upcoming training, conferences, workshops, and more.

HAVE AN EXCITING **STORY TO SHARE?**

Let National CyberWatch Center help share it! Send information to:
promote@nationalcyberwatch.org

**"National
CyberWatch
helped promote a
conference we
were hosting at
Montreat College.
This increased
exposure meant
increased
participation!"**

Jeff Teo
Professor of Cybersecurity and
Director of Cybersecurity
Montreat College



NATIONAL CYBERWATCH CENTER
• *Cybersecurity Education Solutions for the Nation* •



NationalCyberWatch.org

Promoting the DHS Stop.Think.Connect Academic Alliance program:

“Long Beach City College joined the Academic Alliance as a result of your email blast, and we expect many other requests to come in (if they haven’t already). Ten new colleges joined the Campaign since last week.

We wanted to take a minute and thank you for your support! We appreciate it and are seeing results on our end.”

Traci Stathis

Booz | Allen | Hamilton

Contract support to the Stakeholder Engagement and
Cyber Infrastructure Resilience Division

Office of Cybersecurity and Communications

Department of Homeland Security

Promoting Data Privacy Day:

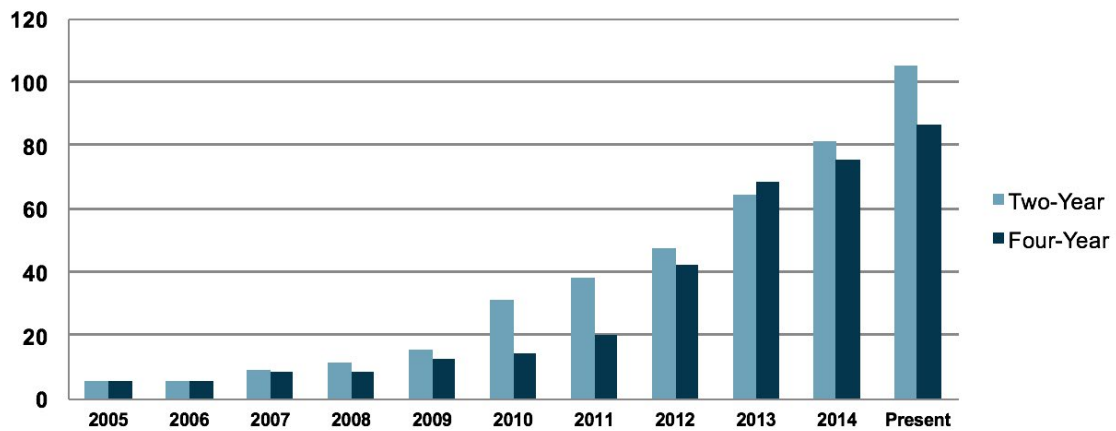
“Thank you for this information and the associated resources. I am able to share them with my students in class and my colleagues during a presentation I am making to them all in two weeks. Keep up the good work!”

Michael McKeever

Computer Networking and Security Instructor

Santa Rosa Junior College

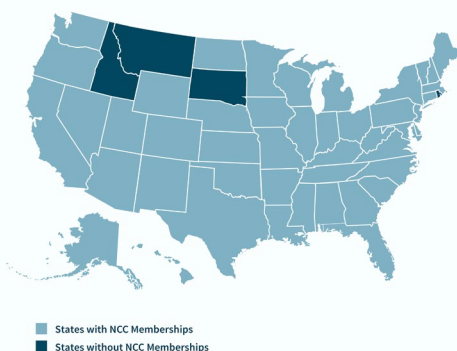
Membership by the Numbers: 2005-2016



MEMBERSHIP

NCC MEMBERSHIP CONTINUES TO GROW WITH CLOSE TO 200 TWO- AND FOUR-YEAR INSTITUTIONS IN ALMOST ALL 50 STATES. THIS CONTINUOUS GROWTH ATTESTS TO THE NEED FOR CONTINUED SUPPORT OF ACADEMIC INSTITUTIONS IN CYBERSECURITY EDUCATION AND WORKFORCE DEVELOPMENT.

NCC Memberships



NCC MEMBERSHIP COMMITTEE

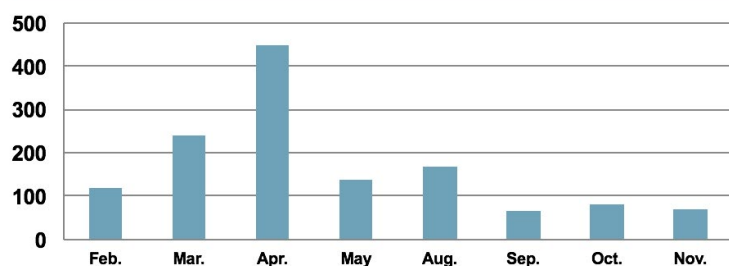
The NCC Membership Committee, comprised of NCC executive and program management team representatives (Dr. Costis Toregas, Teri Kepner, Lewis Lightner), as well as NCC Industry Support board members (G. Mark Hardy, Carrie Leary, Ellen Hause), NCC External Evaluator John Sener, and CyberWatch West Principal Investigator Corrine Sande, completed the Membership Strategic Plan and have been executing it. The updated membership model has the following key goals and characteristics:

- Enhance NCC's ability to serve its members effectively
- Enhance member institutions' ability to participate productively in NCC project activities at a variety of levels
- Help NCC build a community of cybersecurity education institutions and professionals
- Create a greater sense of belonging and participation among NCC members
- Provide a foundation for a membership structure that can evolve as NCC evolves
- Support NCC's efforts for long-term sustainability

2015 WEBINAR SERIES

The NCC Webinar Series promotes the transfer of innovative, cost-effective and sustainable cybersecurity education and workforce development solutions. Topics range from resources available from our NSF ATE partner institutions to government-backed privacy and awareness campaigns.

Webinar Series by the Numbers: Recorded Webinar Views 2015



Using a moderated question and answer format for the 2016 Webinar Series and lessons learned from the past two years, subject matter experts will discuss topics that include:

- Cyber Insurance with Aon Risk Solutions
- Threat Intelligence with Threat.Connect
- Network Security Redux
- Safe and Secure Voting

2015 COMMUNITY COLLEGE CYBER SUMMIT

The Community College Cyber Summit (3CS) meets the need for a national academic conference that focuses on cybersecurity education at the community college level.

Growth, increased collaboration and success describe the 2015 3CS. The second 3CS was held June 17-19 at the College of Southern Nevada. More than 300 faculty, industry and government participants, along with sponsors from EMC, ISC2, Jones & Bartlett Learning, and Excelsior College, attended keynote presentations and hands-on workshops focused on the Summit's theme: *Expanding the Cybersecurity Playing Field: More industries, opportunities, programs, faculty, and students.*



2014 & 2015 3CS by the Numbers	2014	2015
Total # of attendees	183	318
Total # of schools	154	145
Total # of workshops	12	12
Total # of presentations	43	42
Total # of sponsors	6	4
Total # of paid registrations	113	242



CYBERSECURITY COMPETITIONS

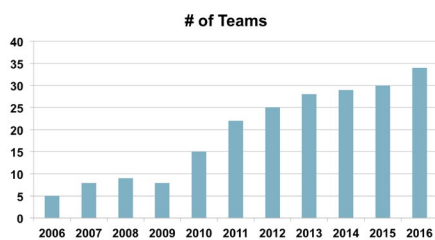
NCC continues to be a world leader in cybersecurity competitions, especially as it relates to workforce development, innovation, technical and soft-skills integration, and skills-based assessments.

MID-ATLANTIC COLLEGIATE CYBER DEFENSE COMPETITION

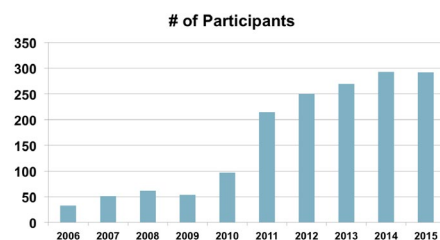
Initiated by CyberWatch in 2006, the MACCDC consists of both virtual qualifying rounds and a face-to-face final round engaging full-time undergraduate and graduate degree-seeking students representing four-year universities and community colleges from Delaware, the District of Columbia, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, and West Virginia. There also is a high school component that attracts large numbers of high school teachers and students during the last day of the competition. In the past 10 years, over 1,500 students have participated in the MACCDC.



MACCDC by the Numbers: 2006-2016



MACCDC by the Numbers: 2006-2016



The 10th MACCDC was held March 25-28, 2015, at the Johns Hopkins University Applied Physics Lab in Laurel, Maryland. In this year's scenario, the Hackistan Army of Liberation (HAL) was once again directing their aggression against the state of Maryland for both supporting the 2013 election in Hackistan (MACCDC 2013) and for their inability to cause major disruption during the 2014 March Blizzard (MACCDC 2014). HAL posted public information threatening U.S. citizens, vowing digital and physical revenge unless their demand was met for halted U.S. support and interference with their country's affairs. HAL possessed highly effective cyber-attack capabilities, and there was high-fidelity intelligence that HAL was targeting regional commuter rail control networks and information systems. Intelligence indicated that HAL was planning on using their cyber-attack as a means of making a statement that U.S. governmental organizations are ineffective and cannot be trusted. Blue teams (student teams) were deployed to regional commuter rail network operation centers to defend against HAL and provide operational services throughout the two-day competition.

As one signature project for NCC, the MACCDC continues to build on strengths from previous competitions, as well as provide ongoing recognition and awareness of NCC. The MACCDC continues to be one of the premier events of its kind in the country, demonstrated by the continued growth and interest from its varied participants, volunteers and sponsors.

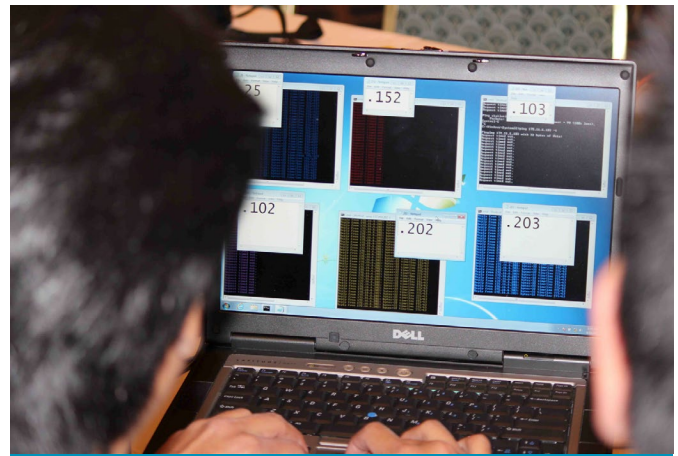
2015 NATIONAL CYBER LEAGUE FALL SEASON

Now in its fourth year, the NCL has a powerful and proven model - provide an ongoing virtual training ground for faculty and students to develop and validate cybersecurity skills using content aligned with individual and team games scalable across many industry certifications, curricula, job roles, and verticals. It was developed and continues to be supported by several ATE centers and university research institutions.



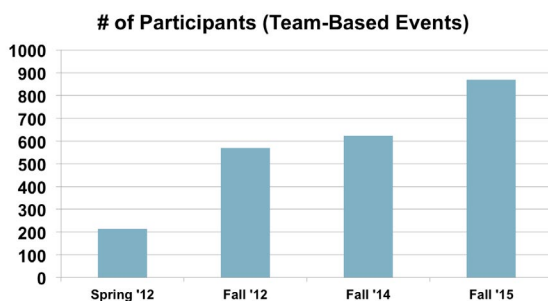
The 2015 Fall Season was by far the largest event the NCL has run and is the largest paid game of its type in the world. The 2015 Fall Season included:

- Record number of participants
- Continued corporate sponsor (Facebook)
- New Stadium environment powered by Cyber Skyline (ncl.cyberskyline.com)
- Continued successful communications and marketing efforts
- 39 virtual preparatory lab exercises enabling players to develop knowledge and hands-on skills any place, any time, powered by the Center for Systems Security and Information Assurance (CSSIA)
- Mandatory Preseason game to identify players with similar knowledge and skill levels
- Provided students with diverse skill levels, fun and engaging learning and playing environments available anywhere, any time
- Measured how players perform in the games and produced individualized Scouting Reports (performance-based assessments)
- Gave faculty opportunities to enrich classes by integrating lab exercises and competitions into existing security-related curricula
- Stimulated individual cybersecurity skills development

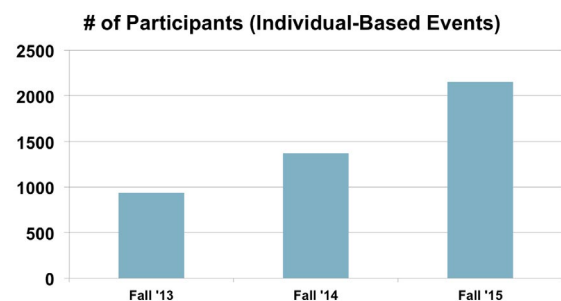


"The National Cyber League program was introduced this year as a required component for our Intro to Computer Security course. The labs, Preseason, Regular season, and Postseason competitions became an incredible catalyst for our Network and Security program. Our class retention and success rates significantly exceeded those of past courses. More importantly, NCL offered the opportunity and challenge to repeatedly do security rather than simply read about it. The NCL labs and competitions meet the students at all skill levels and offer exercises to reward preparation efforts as well as require tenacity and curiosity for success in competitions," said Joe Welch, computer science instructor at Hartnell College. "NCL is exactly the program direly needed by these rising young cybersecurity professionals."

NCL by the Numbers: 2012, 2014-2015



NCL by the Numbers: 2013-2015



THE NCL CONTINUES TO MAKE TREMENDOUS PROGRESS AND IMPACT. IT CONTINUES TO:

- Prove its model and ability to execute
- Establish a valuable brand and track record
- Build valuable relationships with faculty across the country

2014 & 2015 NCL Fall Regular Season by the Numbers

	2014	2015
Total # of registered players	1368	2153
Total # of states	35	41
Total # of schools	145	236
Total # of coaches	233	298

2014 & 2015 NCL Fall Postseason by the Numbers

	2014	2015
Total # of registered players	624	870
Total # of states	23	29
Total # of schools	63	91
Total # of coaches	65	97
Total # of teams	233	298

"From all of us at Honolulu Community College, we wanted to sincerely thank you, your team, and Cyber Skyline for hosting and putting on the National Cyber League. The experience and lessons learned from these series of events have been highly beneficial for all of our students -- both from a technical and a motivational standpoint. It is my firm belief that all of our participating students have garnered a higher degree of aptitude within our field, regardless of what career path they will choose. We look forward to nurturing future teams and hope that you all continue to put on such an excellent and exciting event."

Jayson Hayworth
Vice President

HATS: Hawai'i Advanced Technology Society

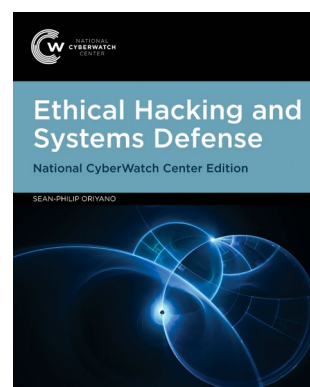
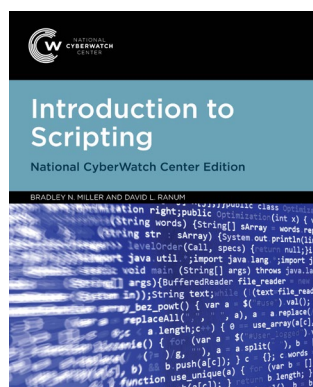
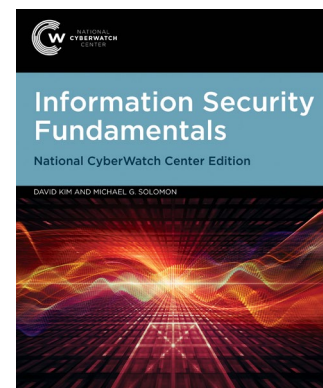
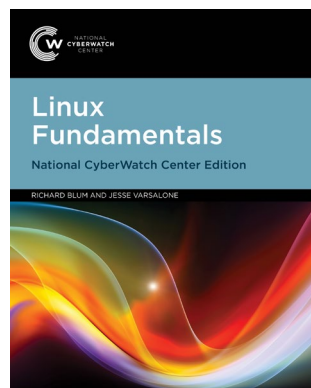
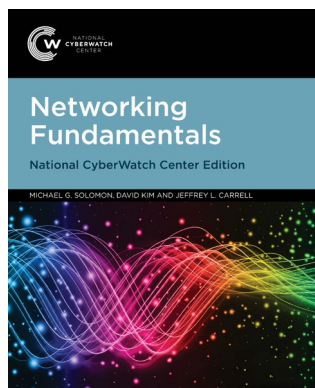
NATIONAL CURRICULUM

In June 2015, NCC started promoting its five degrees and nine certificate programs in Cyber Defense, Network Forensics, Network Security Administration, Secure Software Development, and Systems Security Administration (www.nationalcyberwatch.org/programs-resources/curriculum). Marketing and communication efforts included presentations at the 2015 CISSE and 3CS, reaching as many as 600 two- and four-year educators. Sample course content includes: e-Books, hosted lab environment, supporting virtual machines, lab exercises, lecture slides, assessment questions, videos, syllabi, and instructor guides.

There are 25 technical courses across these degree and certificate programs, which are transferable to many four-year schools. NCC continues to work with Jones & Bartlett Learning (JBL), as well as other industry and academic partners to build skills-based content that supports these courses. Sample course content includes: e-Books, hosted lab environment, supporting virtual machines, lab exercises, lecture slides, assessment questions, videos, syllabi, and instructor guides.

The NCC Curriculum Committee, led by Dr. Margaret Leary, has begun mapping the learning objectives from the NCC technical courses in the Cyber Defense degree/certificate program to the NICE Framework Knowledge, Skills and Abilities (KSAs). In addition, this same group also will map the main topics from the same technical courses in the NCC Cyber Defense degree/certificate program to the NSA/DHS Knowledge Units (KUs). Work will continue until all NCC technical courses from all degrees/certificates are mapped to both the NICE KSAs and NSA/DHS KUs.

As of December 2015, NCC published five e-Books:



NCC continues to develop a lab solution to include skills-based lab exercises available in a hosted environment with associated virtual machines and assessment questions. Key features include Learning Tools Interoperability (LTI), a two-pane user interface written in HTML5, and 24x7 call center support. A version 2 of this solution will be available in February 2016.

In addition to the current curricular offerings, NCC also is developing content and partnerships that focus on Threat Intelligence and Incident Response. NCC has partnered with ThreatConnect to introduce the concepts of Threat Intelligence as a drop-in module for Information Security courses at the collegiate level. A second pilot is in progress to expand the program.

In time for the 2015 NICE conference in San Diego, November 3-4, 2015, NCC announced the alignment of its model degrees and certificates to various NICE job titles. This provides a guide for schools that have adopted (or intend to adopt) the NCC model curriculum in order to develop degrees and/or certificates or assemble courses that meet the cybersecurity workforce roles defined in the Framework.



NCC Cyber Defense Degree and Certificate	
Job Title	NICE Framework Category
Computer Network Defense Analyst	Protect and Defend
Computer Network Defense Infrastructure Support	Protect and Defend
Customer Service and Technical Support	Operate and Maintain
Information Security Analyst	Operate and Maintain
Intrusion Detection System (IDS) Technician	Protect and Defend
Network Administrator	Operate and Maintain
Network Defense Technician	Protect and Defend
Network Services	Operate and Maintain
Red Team Technician	Protect and Defend
Systems Administrator	Operate and Maintain

K-12

The first National K-12 Cybersecurity Conference, funded by NIST, was held October 1-2, 2015.

It brought together educators, faculty members, professionals, researchers, non-profit personnel, other K-12 curriculum specialists, and students to expand a national effort to document the on-going K-12 cybersecurity education programs throughout the country and to address the following goal: to develop a comprehensive agenda focused on the challenges of cybersecurity education at the K-12 level.

Many efforts are underway to encourage students to explore cybersecurity careers. Questions need to be answered, such as: “What are successful programs and strategies to educate students, educators and parents about careers in cybersecurity and other Science, Technology, Engineering and Mathematics (STEM) related pathways?” and “What roadmaps can be drafted, indicating both the resources required and the potential barriers that have to be overcome?”

Continued NSA/DHS National Centers of Academic Excellence in Cyber Defense Two-Year (CAE2Y) Leadership

NCC continues to lead and expand its comprehensive support and technical assistance system for institutions that need to re-designate, as well as those who are new to the CAE program. Efforts include:

- Leveraging the NCC Digital Press Resource Guide: A Guide for Mapping Courses to Knowledge Units (KUs) - a highly popular download from the NCC Library, published by the NCC Digital Press
- Assisting schools with the application process:
 - Dr. Fred Klappenberger has assisted the following schools with mapping their curricula to the CAE KUs:
 - Asheville-Buncombe Technical Community College, NC
 - Daytona State College, FL
 - Farleigh Dickinson University, NJ
 - Glendale Community College, AZ
 - Montgomery College, MD
 - Montreat College, NC
 - Rockland Community College, NY
 - South Central Technical & Community College, KY
 - University of Cumberland, KY
 - University of West Florida, FL
 - Westchester Community College, NY
- Establishing a process toward a national goal of growing more and stronger CAE2Y institutions:
 - A major development in the CAE2Y space has been the establishment of a new project, Catalyzing Computing and Cybersecurity in Community Colleges (C5), headquartered at Whatcom Community College and funded by NSF. The Principal Investigator (PI) for the C5 project is Dr. Vera Zdravkovich. One of the C5 goals aims to significantly increase the number of CAE2Y schools in the next three years, the duration of the project, as well as improving on the quality of the CAE2Y applications. The success of improving the quality and quantity of CAE2Y applications and in general, the cybersecurity programs at community colleges, is predicated on close collaboration of C5 with NCC and CyberWatch West.

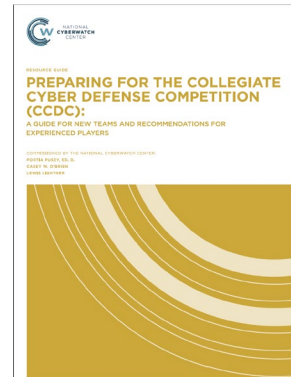
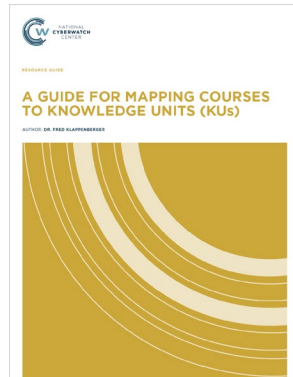


DIGITAL PRESS

The NCC Digital Press continues to produce and disseminate collections of timely publications on topics related to cybersecurity education, research and workforce development.

Updated Resource Guides from 2015 include:

- A Guide for Mapping Courses to Knowledge Units (KUs)
- Preparing for the Collegiate Cyber Defense Competition (CCDC): A Guide for New Teams and Recommendations for Experienced Players



A new report soon to be published, Transfer Pathways in Cybersecurity Education: Challenging Routes, Promising Practices, Possible Improvements, by NCC External Evaluator, John Sener, will be promoted and disseminated in the coming months.

RESEARCH

The NCC Research mission is focused on efforts to promote, sponsor and conduct research on cybersecurity education and workforce development.

NCC co-sponsored a special issue in the National Cybersecurity Institute Journal (NCIJ) on the role of community colleges in cybersecurity education. This issue includes six articles on this topic, including one with several NCC team members as co-authors:

- Cybersecurity Competitions: Recommendations for Assessment, Evaluation and Research by Dr. David Tobey and Dr. Diana Burley

NCC Research staff presented at the Association for Computing Machinery (ACM) Special Interest Group Management Information Systems (SIGMIS) Computers and People Research Conference:

- Focus Group Discussion on Developing a Resilient, Agile Cybersecurity Educational System (RACES) by Dr. Diana Burley and NCC NVC Member Dr. Barbara Endicott-Popovsky
- A Vignette-based Method for Improving Cybersecurity Talent Management through Cyber Defense Competition Design by Dr. David Tobey

NATIONAL CYBERSECURITY STUDENT ASSOCIATION LAUNCH

The National Cybersecurity Student Association, www.cyberstudents.org, is a one-stop-shop to enhance the educational and professional development of cybersecurity students through activities, networking and collaboration with their peers. This group supports the cybersecurity educational programs of academic institutions, inspires career awareness and encourages creative efforts to increase the number of underrepresented populations in the field.

The National Cybersecurity Student Association website launched in late January 2016 and serves as the “virtual home” for the Association. Over 148 student membership requests were received in the first week. In addition, a communications campaign seeking interested Advisory Board participants yielded 30 inquiries. The first Advisory Board meeting is scheduled for February 16, 2016.

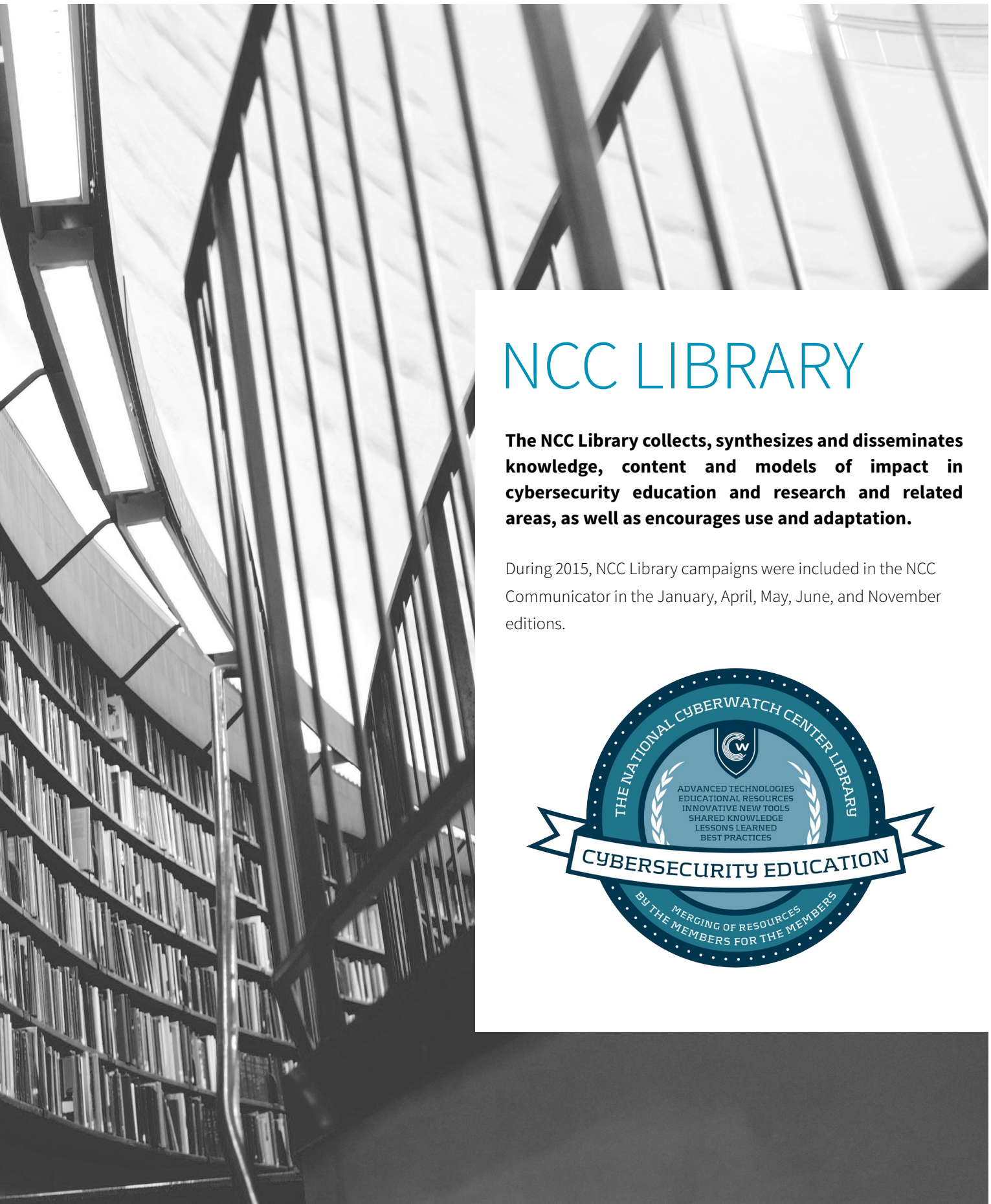
Steps are under way to:

- Solidify membership benefits, dues, processes, and procedures
- Identify sponsors and sponsorship opportunities
- Build a social media presence on LinkedIn, Twitter and Facebook
- Finalize marketing and communications strategies



NATIONAL
CYBERSECURITY
STUDENT ASSOCIATION





NCC LIBRARY

The NCC Library collects, synthesizes and disseminates knowledge, content and models of impact in cybersecurity education and research and related areas, as well as encourages use and adaptation.

During 2015, NCC Library campaigns were included in the NCC Communicator in the January, April, May, June, and November editions.



LOOKING FORWARD

According to the U.S. Bureau of Labor Statistics, cybersecurity jobs will increase by 37% during the decade ending in 2022. That's more than triple the average growth rate (11%) for all occupations in the U.S. [U.S. Bureau of Labor Statistics, 2014]. In addition, the most recent (ISC)2 global workforce study shows that the information security workforce shortfall is widening, and the demand for security technicians is outpacing the

current supply. Of the nearly 1,400 survey respondents, 62% stated that their organizations have too few information security professionals, which is a 6% increase from 2013. This shortfall is estimated to reach 1.5 million by 2020 [Frost & Sullivan, 2015]. Organizations are taking significant measures now to mitigate this projected shortfall by investing in training and education, security technologies and external resources.

Industry Sector	# of Cybersecurity Postings	# of Cybersecurity Postings (2014)	2010-2014 Posting Growth
Professional Services	37%	49,765	57%
Finance and Insurance	13%	17,873	131%
Manufacturing and Defense*	12%	15,968	57%
Public Administration	7%	9,725	N/A**
Information	6%	8,522	65%
Health Care and Social Assistance	6%	7,915	118%
Retail Trade	3%	3,505	120%
Others	15%	19,983	N/A**

*The Manufacturing Sector includes service divisions of a number of defense contractors and computer manufacturers.

**Industry growth rates are suppressed for the Public Administration and Other Industry sectors because a significant portion of labor market demand in these industries exists offline.

Source: Job Market Intelligence: Cybersecurity Jobs, 2015 (Burning Glass)

Cyberattacks on Sony Pictures Entertainment and the Office of Personnel Management (OPM), as well as the compromise of 70 million Anthem medical records, demonstrate how vulnerable the world's networks and systems still are despite recent efforts to build cybersecurity capacity, upgrade workforce skills and

train a new generation of technicians. Our nuclear facilities, electrical power grids, water systems, medical records, financial services, and personal systems are under constant attack. Do we still need to be educating and training a cybersecurity workforce? The answer is obvious.

VISION

NCC will be the go-to resource and partner for innovative and high-quality cybersecurity education, research and assessment solutions. This vision will be realized in the following ways:

- Expand opportunities for NCC to scale ideas and attract new sources of funding
- Integrate business into the NCC "equation" to better align employers with potential employees
- Enhance the unique learning needs to combat ever-changing and damaging cyber attacks

Programmatically, NCC will expand and enhance its strategic and leadership roles as the national ATE cybersecurity center by building, promoting and coordinating:

- Programs and services designed to attract large numbers of diverse populations
- Career readiness programs
- Skills-based curricula
- Collaboration among industry, government and academia
- Educational, training and assessment standards for the burgeoning information security discipline
- Capacity development

GOALS

Goal I: Build and Support Program Capacity Based on Models of Impact. *Build and promote degree/certificate programs, institutional recognition, model curricula, transfer pathways, and faculty capacity.*

Sample activities include:

- Facilitate the dissemination of effective practices from existing NSF ATE centers/projects, as well as other sources, to help other community colleges establish and grow their cybersecurity programs
- Continually enhance its own curricula - degrees, certificates, stackable certificates and credentials, course modules, and informal programs
- Champion the expansion and growth of robust community college cybersecurity education programs with emphasis on the CAE2Y designation

GOAL II. Increase Student Engagement. *Enhance the visibility, recruitment and attractiveness of community college cybersecurity educational programs and students.*

Sample activities include:

- Facilitate the recruitment of community college students to fill the growing demand for cybersecurity talent
- Expand opportunities for community college students through scholarships, internships and apprenticeships
- Expand and promote cybersecurity education transfer pathway models that utilize a broad range of promising practices (model articulation agreements, stackable competencies, reverse transfer)
- Increase membership and participation in the National Cybersecurity Student Association

GOAL III: Sustain a Culture of Collaboration. *Catalyze and promote state and local collaborations among higher education institutions, businesses and professional organizations to promote the growth of cybersecurity programs nationally.*

Sample activities include:

- Catalyze the formation of state and regional consortia in cybersecurity education
- Lead and support collaborative efforts among NSF ATE centers, higher education institutions, employers, and industry associations

GOAL IV: Infuse Cybersecurity across the Curricula. *Promote and partner on “CyberC,” a National Collaboration for Cybersecurity Education throughout the National Critical Infrastructure (NCI), as well as build, promote and integrate interdisciplinary cybersecurity learning modules.*

Sample activities include:

- Integrate cybersecurity learning modules in other curricula
- Partner with industry groups (Federal Services Sector Coordinating Council), critical infrastructure-focused academic networks (CyberWatch West, Center for Systems Security and Information Assurance), and government organizations (DHS Critical Infrastructure Cyber Community) to promote and disseminate cybersecurity education practices and principles across the academic community serving one or more critical infrastructure sector(s) – a.k.a., CyberC

GOAL V. Advance Research in Cybersecurity Education and Workforce Development. *Support evidence-based cybersecurity education research and develop effective models for conducting research.*

Sample activities include:

- Provide evidence-based practices for NCC goals by documenting replicable models, outcomes and impacts
- Conduct primary research with employers to identify projected labor market demand for a cluster of middle skill cybersecurity occupations (i.e., those which require education beyond high school but not a four-year degree). This ongoing research is essential because community colleges are a practical delivery solution for the huge shortage of qualified applicants for cybersecurity positions, especially those identified as “middle-skilled”

SUMMARY

NCC promises a significant and far-reaching impact on cybersecurity education, workforce development and research in community colleges and beyond. This promise is realistic as attested by significant accomplishments, advances and impact in the current grant period. Given that community college cybersecurity education was in its infancy only a decade ago, NCC, its predecessor CyberWatch Center and the other NSF ATE cybersecurity centers/projects have already created many useful resources and have reached an impressive audience, while at the same time increasing the quantity and quality of the information security technician workforce; yet the nation's cybersecurity challenges remain daunting. NCC's track record shows that it has the capacity to advance community college cybersecurity education to the next level in achieving its mission of leading collaborative efforts to advance cybersecurity education and strengthen the national cybersecurity workforce. NCC's well-thought-out management structure and world-class personnel provide the necessary ingredients for success. Finally, NCC's sustainability plan provides a path for a successful final chapter of this national center, which will continue as a viable entity into the foreseeable future.



NATIONAL CYBERWATCH CENTER **TEAM**

The NCC team has benefited from continuity in leadership and knowledge transfer over the past 10 years, as well as from recruiting new subject matter experts from across the country bringing an infusion of new energy and varied perspectives. The 2015 NCC Team includes:

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Maryland

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Director & Co-Principal Investigator
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George Washington University
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Director & Co-Principal Investigator
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Chair, Community College Cyber Summit
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Director, NCC Programs
Competition Director, MACCDC
BrightPath Technology
North Carolina

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Director
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Washington, D.C.

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Virginia

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Finance
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Director
National Cybersecurity Student Association &
NCC Library
Portillo & Associates
Kansas

Lynn Dohm*

Director
Marketing & Communications
Nelly Group
Illinois

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Prince George's Community College
Maryland

Michael Burt

Virtual Lab Manager
Prince George's Community College
Maryland

**** NCC Executive Team Members**

*** New NCC Team Members**

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Military Cyber Professionals Assoc.
Natl. Institute of Standards & Technology
National Security Agency
Patriots Technology Training Center
Tenable Network Security
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MISSOURI

Parameter Security

NORTH CAROLINA

Fast Lane

NEW MEXICO

EC-Council International

OHIO

Cengage Learning

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Logical Security

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(ISC)2
BAE Systems
Booz Allen Hamilton
Cypherpath
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National Partnership
Neustar
Northrop Grumman
Pragmatics, Inc.
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TASC
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John R. Rogers High School
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Sacramento City College
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Florida A&M University
Hodges University
ITT Technical Institute
Pensacola Junior College
Santa Fe College
University of Central Florida
University of West Florida
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Cecil College
College of Southern Maryland
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Frederick Community College

Garrett College
Hagerstown Community College
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Hood College
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Kaplan University - Hagerstown
Loyola University of Maryland
Montgomery College
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Towson University
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University of Maryland College Park
University of Maryland Eastern Shore
University of Maryland University College

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University of Maine
University of Maine at Fort Kent

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Delta College
Eastern Michigan University
Ferris State University
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Monroe County Community College
Mott Community College

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Southern New Hampshire University

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Stockton University
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New Mexico State University

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Truckee Meadows Community College

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Alfred State College
Borough of Manhattan Community College
Herkimer County Community College
Mercy College
Mohawk Valley Community College
Monroe Community College
Rockland Community College
United States Merchant Marine Academy
University at Buffalo
Utica College
Westchester Community College

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Columbus State Community College
Cuyahoga Community College
Stark State College
Zane State College

OKLAHOMA

Francis Tuttle Technology Center

Oklahoma City Community College

OREGON

Mt. Hood Community College

PENNSYLVANIA

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Community College of Beaver County
Drexel University
Lehigh Carbon Community College
Millersville University
Montgomery County Community College
Robert Morris University
St. Vincent College
Valley Forge Military College
Westmoreland County Community College

RHODE ISLAND

New England Institute of Technology

SOUTH CAROLINA

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Technical College of the Lowcountry
The Citadel

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University of Tennessee at Chattanooga
Volunteer State Community College

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Richland College
St. Philip's College
Tarrant County College
Texas A&M University San Antonio
Texas State Technical College - Harlingen
University of Houston

UTAH

Fortis College
Salt Lake Community College
Western Governors University

VIRGINIA

American National University
George Mason University
Hampton University

James Madison University
Liberty University
Lord Fairfax Community College
Marymount University
New River Community College
Norfolk State University
Northern Virginia Community College
Patrick Henry Community College
Piedmont Virginia Community College
Radford University
Security University
Thomas Nelson Community College
Tidewater Community College
Virginia Western Community College

VERMONT

Champlain College
Norwich University

WASHINGTON

Highline College
Whatcom Community College

WISCONSIN

Gateway Technical College
Waukesha County Technical College

WEST VIRGINIA

Blue Ridge Community and Technical College
Bridge Valley Community and Technical College
West Virginia Northern Community College

WYOMING

Laramie County Community College



This material is based on work supported by the National Science Foundation (NSF) under Grant Number DUE-1204533. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the author(s) and do not necessarily reflect those of NSF.



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