

# Cybersecurity – High School and Beyond

## High School Career Fair and Expo

March 29, 2014

*THE VALUE OF PERFORMANCE.*  
***NORTHROP GRUMMAN***

Diane G. Miller, CCP  
Director, Operations  
Northrop Grumman Information Security  
Program Director, CyberPatriot

- Why a Career in Cybersecurity?
- The Cybersecurity Professional
- High School Cyber Activities
- College Cyber Activities
- Building Your Academic Foundation
- Career Opportunities
- Resources
- Summary

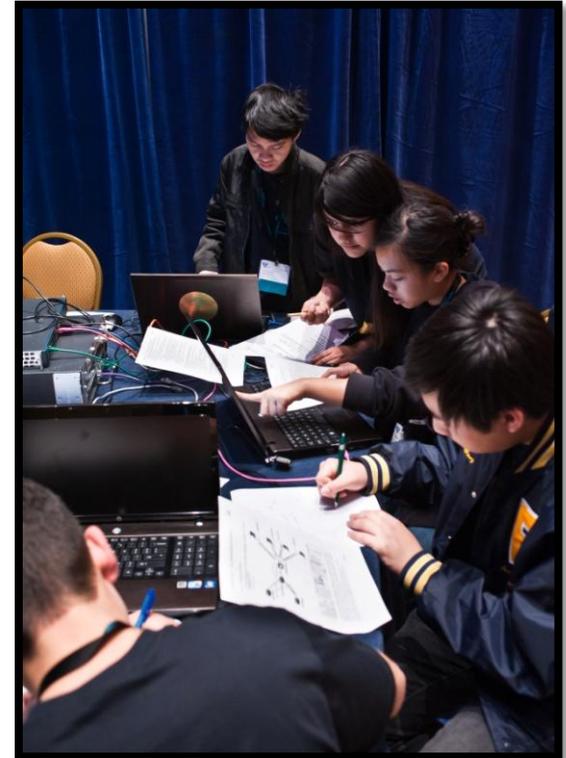


# Why a Career in Cybersecurity?

- Lifestyle dependence
- Defense and Protection of Information
  - Personal
  - Private Industry
  - Public Infrastructure
  - National Security
- Critical fields for our Nation's:
  - Continued security
  - Economic prosperity
  - Critical infrastructure protection
  - Global competitiveness
- Current and future demand
  - Thousands of jobs currently open across the government and private industry
  - Continued need for bright minds and innovative solutions!



- Disciplines of Science, Technology, Engineering and Mathematics
- Variety of Academic Offerings
  - Computer Science
  - Electrical and Computer Engineering
  - Information Technology
  - Information Systems
  - Information Assurance
  - Information Security / Computer Security
  - Software Engineering
- Certifications
  - Enhance career opportunities
  - CISSP, CEH, certain programming languages
- Careers Continue to Evolve
- Career Opportunities at All Levels of Education



Define Your Own Career in Cybersecurity!

# The Cybersecurity Professional

- Technical
  - Education foundation in STEM discipline
  - Skills in analysis, synthesis, critical thinking, structured problem solving
  - Technical creativity
- Behavioral
  - Ability to consider various options in decision-making process
  - Ability to effectively communicate orally and in writing
  - Ability to “think outside the box” – fresh approach
  - Ability to work in teams – small and large
  - Determination and persistence
  - Collaborative
- Personal
  - Integrity
  - Passion for what you do!
  - Good lifestyle choices - security



# High School Cyber Activities

- CyberPatriot
- Clubs and Camps
- Internships



# CyberPatriot Overview

- CyberPatriot is the largest national high school cyber defense competition designed to excite, educate, and motivate the next generation of cyber defenders (and other STEM graduates) critical to our nation's future security
- Conceived and led by the Air Force Association; Northrop Grumman Foundation is Presenting Sponsor
- This year's competition had 1,566 teams from 50 states plus Guam, Puerto Rico, US schools in Europe and the Pacific



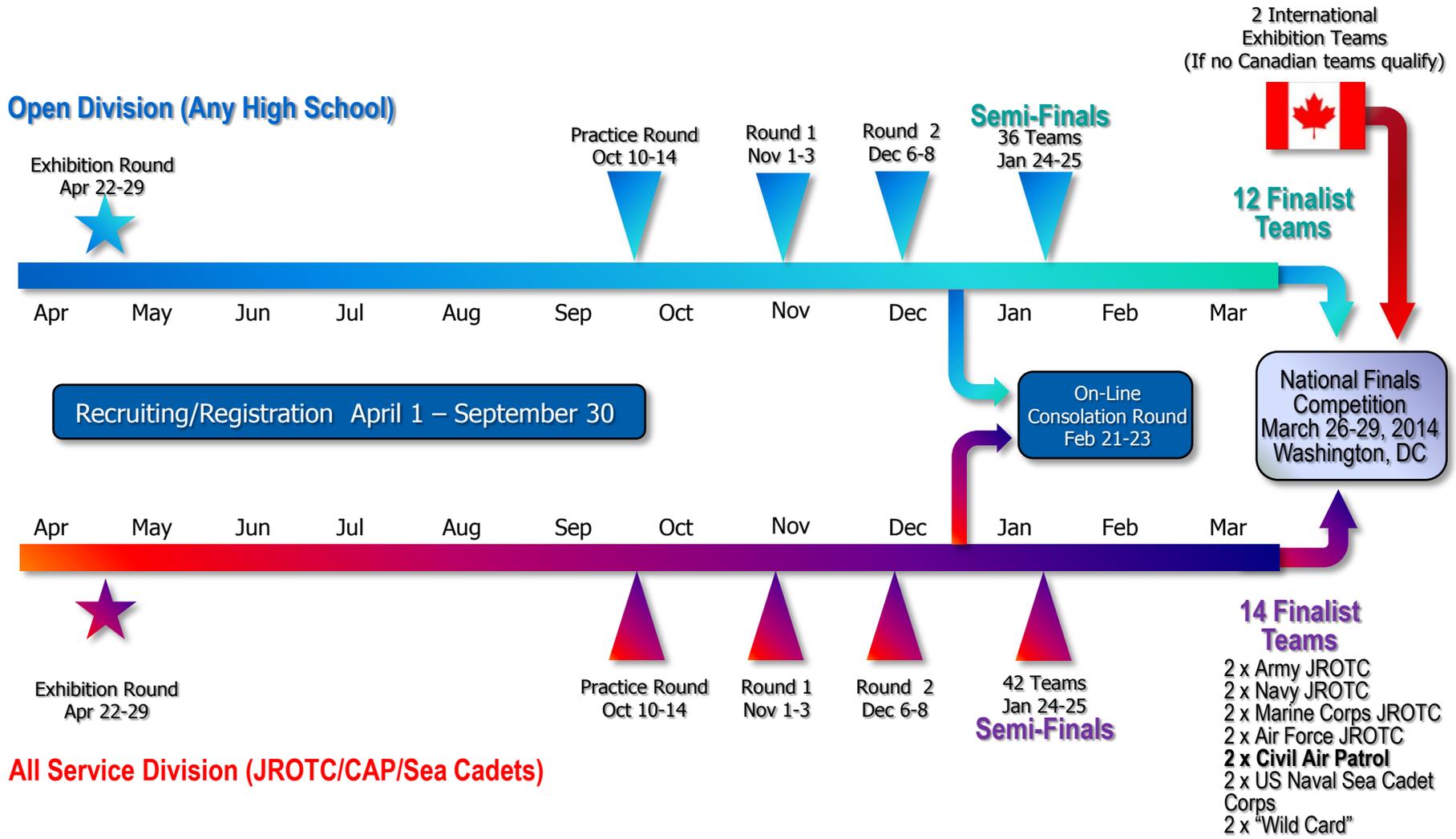
- Students learn teamwork, communications, collaboration, and cybersecurity
- Over 70 CyberPatriots were hired by Northrop Grumman as summer interns in 2011, 2012 and 2013
- Northrop Grumman awarded over \$158,000 in scholarships to be applied to college for top teams

# Northrop Grumman's Participation

- Reaching out to schools to encourage registration
- Offering employee volunteers as mentors and technical advisors to teams
- Providing information to schools that wish to participate
- Promote careers in cybersecurity and build a pipeline of talent
- More information:
  - [www.uscyberpatriot.org](http://www.uscyberpatriot.org)



# CyberPatriot VI Competition Timeline



**CP-VII Recruiting Pre-Registration Jan 1 – Apr 1 2014**

- Clubs

- Computer Club, various extra-curricular activities at school
- Clubs sponsored through community / school district programs; regional and state level organizations

- Camps

- National-level programs offering camps around the country
  - US Cyber Challenge one-week summer camp
  - CyberPatriot Summer Camps beginning 2014
- Local / community summer camps sponsored by corporations, universities or the public school district
- On-Line camps with specific skill development offerings

# High School Internships

- Many internships available across the U.S.
- Opportunities in Cyber Security Operations Center, developing cyber applications for various platforms, contributing to real-world cyber solutions
- Work side-by-side with cyber professionals for valuable experience
- Sign up for Cyber eNewsletter to stay informed of cyber events and opportunities
- Requisitions may be found at:

[www.northropgrumman.com/careers](http://www.northropgrumman.com/careers)



# College Cyber Activities

- Formal Education
- Informal and Hands-On Education
  - Competitions
  - Clubs and Camps
- Research



# Building Your Academic Foundation

## Formal Education

- National Centers of Academic Excellence
  - Joint Program sponsored by National Security Agency (NSA) and the Department of Homeland Security (DHS)
  - Objective: *“reduce vulnerability in our national information infrastructure by promoting higher education and research in IA and producing a growing number of professionals with IA expertise in various disciplines”*
  - Certified programs at academic institutions in 43 states across the United States
    - National Centers of Academic Excellence in IA Education (CAE/IAE): 127
    - IA Research (CAE/R): 57
    - IA 2-year Education (CAE/2Y): 32
  - More Information: [http://www.nsa.gov/ia/academic\\_outreach/nat\\_cae/index.shtml](http://www.nsa.gov/ia/academic_outreach/nat_cae/index.shtml)
- NICCS: National Initiative for Cybersecurity Careers and Studies
  - a national resource for cybersecurity awareness, education, careers, and training
  - More Information: <http://niccs.us-cert.gov/>

Emphasis on Academic Foundation Aligned with Future Careers

# Building Your Academic Foundation Informal and Hands-On Education

- Competitions
- Clubs and Camps
- Research



# Informal and Hands-On Education Competitions

- **Wide Variety of Cyber Competitions**
  - **Individual:** Typically involves reviewing materials and then taking a “test” to measure knowledge. Participants may be grouped by age, skill area, geographic area, etc.
    - US Cyber Challenge, Cyber Aces
  - **Team:** Prepare with written, hands-on materials and perhaps live instruction; may be integrated with academic curriculum; local competition typically virtual; regional and national competitions may be in-person.
    - CyberPatriot, Collegiate Cyber Defense Competition (CCDC)
  - **Type:** Some focus on *defensive* cyber activities – identification and eradication of vulnerabilities; others include *offensive* activities – penetrate and/or harm others’ computers/systems
  - **Capture the Flag:** Attack / Defense or Jeopardy
    - DEF CON
- **National Initiatives for Cybersecurity Competitions**
  - The *Cybersecurity Competition Federation (CCF)* is a network of stakeholders which provides value for our collective endeavors while maintaining the autonomy of individual competitions.
  - The *National Cyber League (NCL)* provides an ongoing virtual training ground for collegiate students to develop, practice, and validate their cybersecurity skills.

# Informal and Hands-On Education

## Collegiate Cyber Defense Competition (CCDC)

- Conceived in 2004 by a group of educators, students, government and industry representatives
- Initial competition hosted by Center for Infrastructure Assurance and Security (CIAS) at the University of Texas at San Antonio in 2005; now in nine regions across United States
- Mission is to provide institutions with an information assurance or computer security curriculum a controlled, competitive environment to assess their student's depth of understanding and operational competency
- Northrop Grumman is a sponsor of the Mid-Atlantic Regional Competition and the National Competition
- Local and Regional Competitions culminate in National Competition for three days in San Antonio, Texas, in April each year
- More information: <http://www.nationalccdc.org/>

# Informal and Hands-On Education Competitions

Intense competition; lots of preparation, practice and hard work are the recipe for a winning team!



| 2013 National CCDC Standings   |   |  |
|--|---|--|
| Pacific Rim Regional CCDC<br> | 1st Place<br>  | Midwest Regional CCDC<br>     |
| Western Regional CCDC<br>     | 2nd Place<br>  | Northeast Regional CCDC<br>   |
| North Central CCDC<br>       | 3rd Place<br> | Mid-Atlantic CCDC<br>        |
| Southwest Regional CCDC<br> |   | Southeast Regional CCDC<br> |
| At-Large Regional CCDC<br>  |   | Rocky Mountain Regional<br> |

## 2013 National Collegiate Cyber Defense Competition Champions:

- 1st Place:** Rochester Institute of Technology
- 2nd Place:** Dakota State University
- 3rd Place:** Rose-Hulman Institute of Technology

## 2013 Regional Collegiate Cyber Defense Competition Champions:

- Pacific Rim:** University of Washington
- Western:** California State Polytechnic University, Pomona
- North Central:** Dakota State University
- Southwest:** Oklahoma State University
- At Large:** University of Alaska Fairbanks
- Mid-West:** Rose-Hulman Institute of Technology
- Northeast:** Rochester Institute of Technology
- Mid-Atlantic:** Millersville University
- Southeast:** University of Central Florida
- Rocky Mountain:** United States Air Force Academy

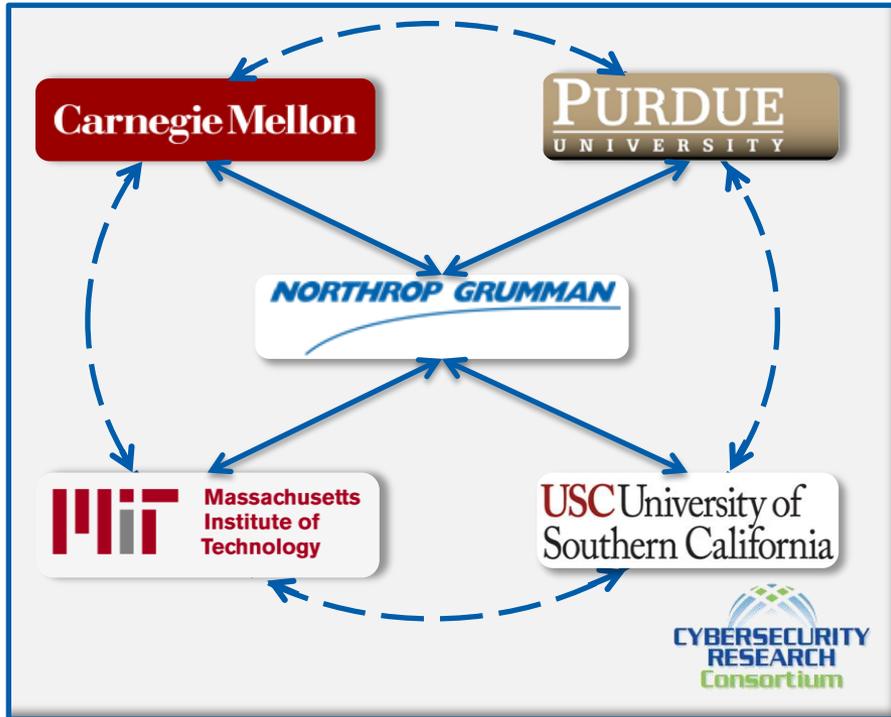
- Clubs

- National Cybersecurity Student Association
- Associations and Clubs at colleges and universities; oftentimes a student chapter affiliated with a professional association

- Camps

- National-level programs offering camps around the country
  - US Cyber Challenge one-week summer camp
- Local / community summer camps sponsored by corporations, universities or the public school district
- On-Line camps with specific skill development offerings

## Northrop Grumman Cyber Research Consortium (NGCRC)



*Developing discriminating cybersecurity solutions through joint research with world class academic institutions that ensure the safety of our nation and brings business value to Northrop Grumman*

### Concept

- Operate a research consortium for challenging cyber security problems
- Combine NGC with leading research university centers
- Scope includes joint NGC-university research (IRAD and CRAD)

### Objectives

- Develop leading edge technology concepts and discriminators
- Stimulate thought leadership, technology innovations, educational initiatives, communications
- Recruiting at top university cybersecurity programs

### NGCRC Operations

- Establish complementary projects at NGC and universities
- Active collaboration Frequent personal and network communications –
- Semi-annual NGCRC meetings
- Contract research proposals

### Research Areas

- 14 research areas defined
- Matched to NGC cyber strategy and NGCRC member strengths
- Continuing review of topics based on NGC operations

- Mentor – Protégé Relationship
- Internships and Co-Op Opportunities while in college
  - Career Center
  - Club sponsors or parent organizations
  - Professors and Academic Advisors
  - Alumni Associations
- CyberCorps® Scholarship For Service (SFS)
  - Designed to increase and strengthen the cadre of federal information assurance professionals that protect the government's critical information infrastructure
  - Available to full-time students at the undergraduate and graduate levels
  - Funded through National Science Foundation grants

- **Cyber Professionals in Demand in All Business Sectors**
  - Internet-based Commerce
  - Critical Infrastructure
    - Transportation
    - Energy
  - U.S. Government
    - Federal Agencies
    - Defense / Intelligence Community
  - State and Local Government
  - Health Care
  - Finance and Banking; Global Economy
  
- **Position of Trust**
  - Some Business Sectors or Positions may require security clearance

## Cyber Systems / Solutions Development

- Cyber Systems Architect
- Cyber Systems Engineer
- Cyber Software Engineer
- Cyber Hardware Engineer
- Cyber Database Architect

## Cyber Operations

- Cyber Information Assurance Analyst
- Cyber Forensic Specialist
- Cyber Intelligence Analyst
- Incident Analyst Responder
- Cyber Operator

Department of Homeland Security (DHS) National Initiative for Cybersecurity Education (NICE)

<http://csrc.nist.gov/nice/index.htm>

DHS National Initiative for Cybersecurity Careers and Studies (NICCS)

[www.niccs.us-cert.gov](http://www.niccs.us-cert.gov)

Collegiate Cyber Defense Competition

<http://www.nationalccdc.org/>

National CyberWatch Center

[cyberwatchcenter.org](http://cyberwatchcenter.org)

CyberPatriot (The National Youth Cyber Education Program)

<http://www.uscyberpatriot.org> (AFA CyberPatriot Program)

[cyberpatriot@ngc.com](mailto:cyberpatriot@ngc.com) (Northrop Grumman)

Northrop Grumman Careers

<http://www.northropgrumman.com/careers>

- Science, Technology, Engineering and Mathematics are fun subjects that lead to exciting careers!
- Many opportunities exist to continue your education and challenge your skills in cybersecurity – all leading to greater opportunity for employment in cyber-related professions
- We need a stronger workforce in the STEM subject areas to protect our nation's security and the lifestyle we enjoy – become part of the solution!

***THE VALUE OF PERFORMANCE.***

***NORTHROP GRUMMAN***

