National Visiting Committee meeting

April 16, 2009

Introduction and Welcome

Vera Zdravkovich

Highlights
Grant Renewal
Transition Plan

CyberWATCH Partners, Advisory Board, Strategic Plan

Bob Spear

CyberWATCH Partners: Roles and Status

- Lead institution -- PGCC (Leadership, Newsletter, Graduate Faculty Program, Marketing)

- Core Partners – Institutions that receive sub-awards: AACC (Curriculum); NVCC (Professional Development); CCBC (CCDC); MC (Virtual Lab); UMD (K-12 initiatives, Digital Forensics Lab, BRAC supplement); BSU (CUTS); GWU (Virtual Job Fair)

- Affiliate Partners – Other member institutions
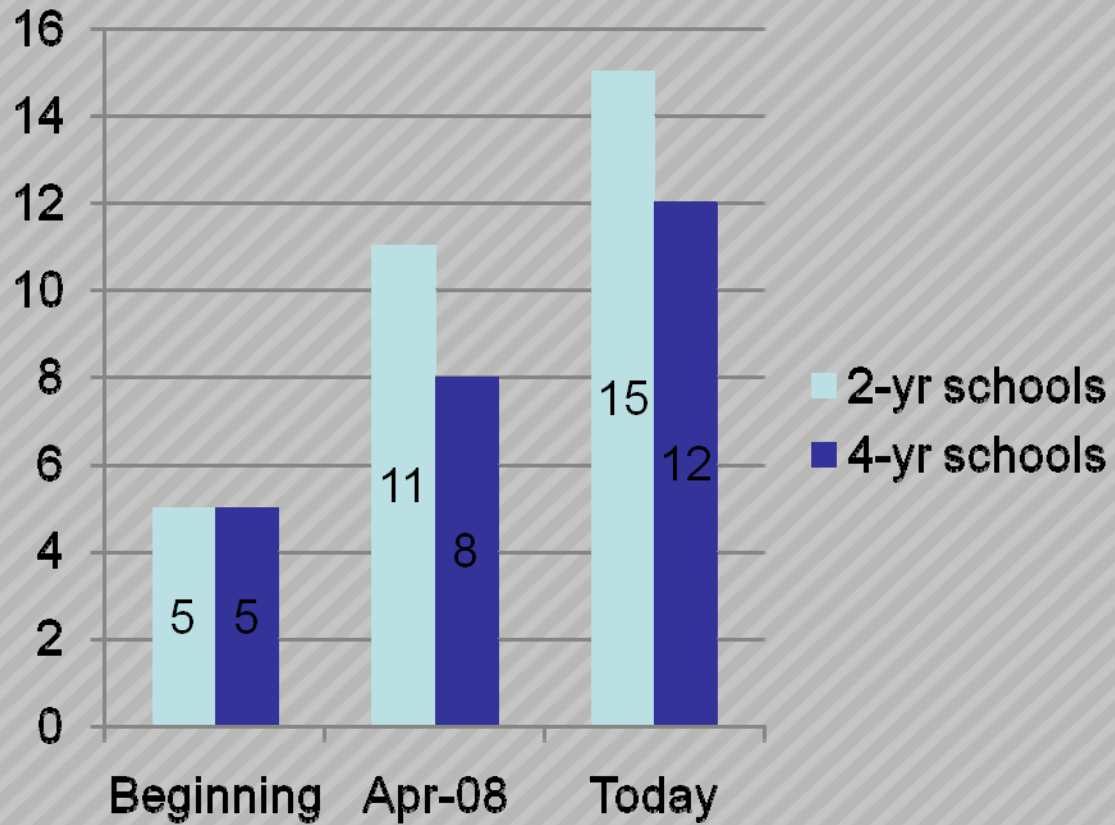
CyberWATCH Growth

CyberWATCH Advisory Board

- 7 new members since last NVC
- Originally 15 members, now 26
- Leaders in government, industry, and academe

Five Advisory Board Committees

- Curriculum Development – Fred Klappenberger
- Collegiate Cyber-Defense Competition – Casey O'Brien
- Outreach Committee – Bob Spear
- Internships Committee – Sally Sullivan
- Security Professional Development – Margaret Leary

CyberWATCH Strategic Plan and Year 4 Action Plan

- Plans address original CyberWATCH goals.
- Sustainability: RFP to develop a business plan:
  - Issued April 1
  - Due April 28
  - Contract award expected May 15

Curriculum Development

Fred Klappenberger

Committee Composition

- Nine members from academic community
  - Community colleges and four year institutions

- Six Advisory Board members
  - Business and government

Observations

- Two year degree prepares technicians – blue collar
  - Limited career advancement opportunities
- Four year degree prepares analysts
  - Baseline requirement for professional advancement
- Need pathways from CCs to 4 year institutions

Need Soft Skills

- All levels need to be able to
  - Organize and communicate thoughts logically
  - Critical thinking
  - Work effectively with team members
  - Write clearly
  - Make cogent presentations
- These can be taught and practised within technical courses
- Need to be familiar with and able to interpret industry and government security standards
- Must understand how businesses and organizations work, regulations that apply, value of formal policies and procedures

Aspirations

- Model AAS program helps students prepare for several certifications
- All graduates should aspire toward one or more certifications
  - Especially, CompTIA's Security +
    - DoD 8570.1 Tech levels 1 & 2, Mngt level 1
    - Offer Security+ prep course
- Continue academic growth with baccalaureate
  - Articulation agreements

Articulation Obstacles - 1

- Baccalaureate institutions expect CC coursework to mirror their own

- Coursework taken at CC does not count toward degree, lengthening time to graduate

- Disagreement between 2 and 4 year institutions whether courses offered by both institutions are appropriately offered at lower or upper division

- In-place articulation agreements are not adhered to by offices below level of Provost and President

- Academic departments at 4 year institutions have little or no incentive to be proactive in maintaining agreements

Articulation Obstacles - 2

- Differences in GenEd requirements – incoming GenEd transfer courses almost always count but may only count as electives – or - varied/idiosyncratic GenEd requirements that make it virtually impossible for CC student to take courses that meet all 4 year institutions' requirements

- Assumption that only upper division institutions can provide core content, which is frequently redundant with CC coursework

Overcoming the Obstacles
(Yes We Can!)

- Work with 4 Year institutions to facilitate articulation agreements
  - View CC credits holistically
  - Build Junior and Senior years around CC graduates' needs – reconsider the educational pyramid – invert or tilt it
- 4 Year institutions need incentive to
  - Blend CW students into existing programs, or
  - Create programs that seamlessly place CW students into upper level status – holistic approach
  - Recognize life experience, maturity of CC graduates

Articulation Agreements

- Eight Community Colleges have entered into agreements with eight 4 Year Institutions
  - AACC, CCBC, CoSM, HowCC, Mntgmy Coll, NVCC, PGCC, and Whatcom CC
  - Capella, Capitol, DeVry, JHU, Strayer, TU, UB, UMUC

Recent Additions

- Additional courses
  - Two Computer Forensic courses - NVCC
  - Contributed by partner CCs
    - Share with all partners through Web site
    - Being formatted to have "CW look"
- Instructional Software tools
  - List of 50 mostly freeware tools used in courses
  - Share on Web site w/ links to download pages

Distance Learning

- Need to meet needs of distance learning audience
- Several partners offer online versions of core technical courses now
- Goal: Provide full range of on-line courses
  - Planned for 1st year of continuation grant for model ISS program
  - Disseminate through Maryland Online Consortium and/or individual institutions

Digital Forensics

- Committee recommends Digital Forensics curriculum
  - Proposed in CW II
  - NVCC has developed 2 courses offered Spring 2009
    - Forensics I – Physical Layer
    - Forensics II – Logical Layer
  - Erie CC offers Certificate in DF
  - All DF courses under review by Curriculum Committee

Disaster Recovery & Risk Management

- Montgomery College and PGCC jointly developed Disaster Recovery and Risk Management course
  - Prepare for and recover from natural and man-made disasters
  - PGCC developed Ltr of Recognition and Certificate
- AACC developed two electives and a review course:
  - Voice Over IP – Fundamentals,
  - Voice Over IP – Quality of Service, and
  - Cisco Certified Network Administrator Review
    - CCNA test is administered as part of Review

Material Sharing

- Courses are shared on the CyberWATCH Center Web site
- List of instructional software tools with hotlinks
  - Most of the software is freeware
 - Software keyed to courses

Course Cross-Referencing

- Continuation of adding partner course designation to CW cross-referencing

  - Establishes content equivalency between inconsistent titles and designators

- Partner institutions include CW designation in college catalog course descriptions

  - Simplifies transcript evaluation between colleges

  - Aids creation of articulation agreements

CW Model Program Adoption
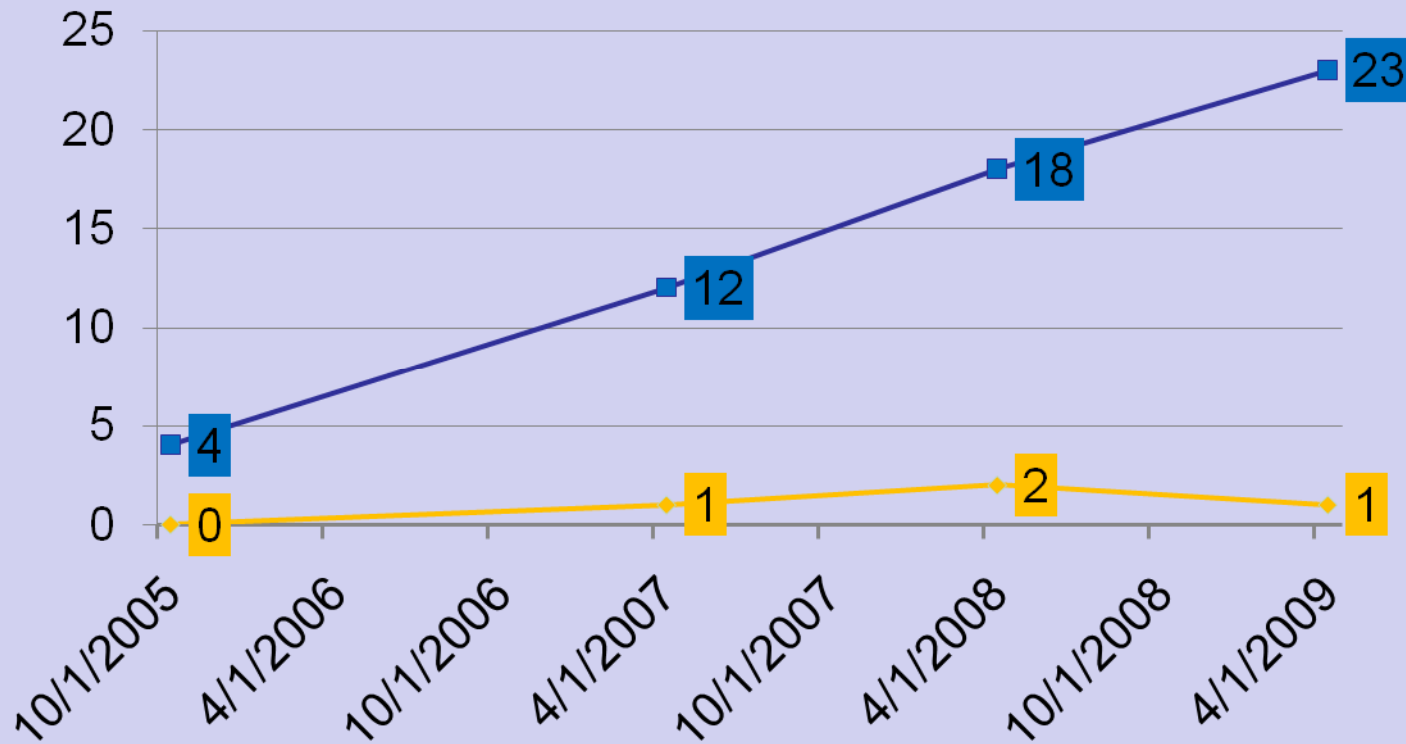
Effectiveness

- Measure of CW Model program effectiveness
  - 40%: Switched from another degree
  - 27%: Enrolled because ISS offered
  - 86%: Plan to work in field after graduation
  - 19%: Plan to work in non-ISS field
  - 59%: Plan to obtain bachelor's degree in field
  - 15%: Plan to obtain non-ISS bachelor's degree
  - 77%: Intend to obtain some certificate (e.g., Network+, Security+, CCNA , etc.)

Course Mapping

Elizabeth Harrison

- **4011 Standings**
  - 2009 Certifications: Southern Maryland, Hagerstown CC
  - 2009 Recertification's: Anne Arundel CC
  - 2007-08 Certifications: CCBC, Howard CC, PGCC, Northern VA, Whatcom CC
  - 2009-10 Target: Chesapeake CC, Erie CC, Harford CC, Montgomery College, A-B Tech, Wilmington U, George Mason Undergrad, UMES

- **4013 Standings**
  - 2009 Certifications: Hagerstown CC, PGCC (pending)
  - 2007-2008 Certifications: Anne Arundel CC
  - 2009-10 Target: CCBC, Harford CC, Howard CC, Montgomery CC, Northern VA, A-B Tech, Southern Maryland, Wilmington U, George Mason Undergrad

CNSS MAPPING

- **Recertification Schedule**
  - 4011
    - 2012: CCBC, Northern VA, PGCC, Whatcom CC
- **Partners certified to multiple standards at Graduate level:**
  - Towson
  - George Mason
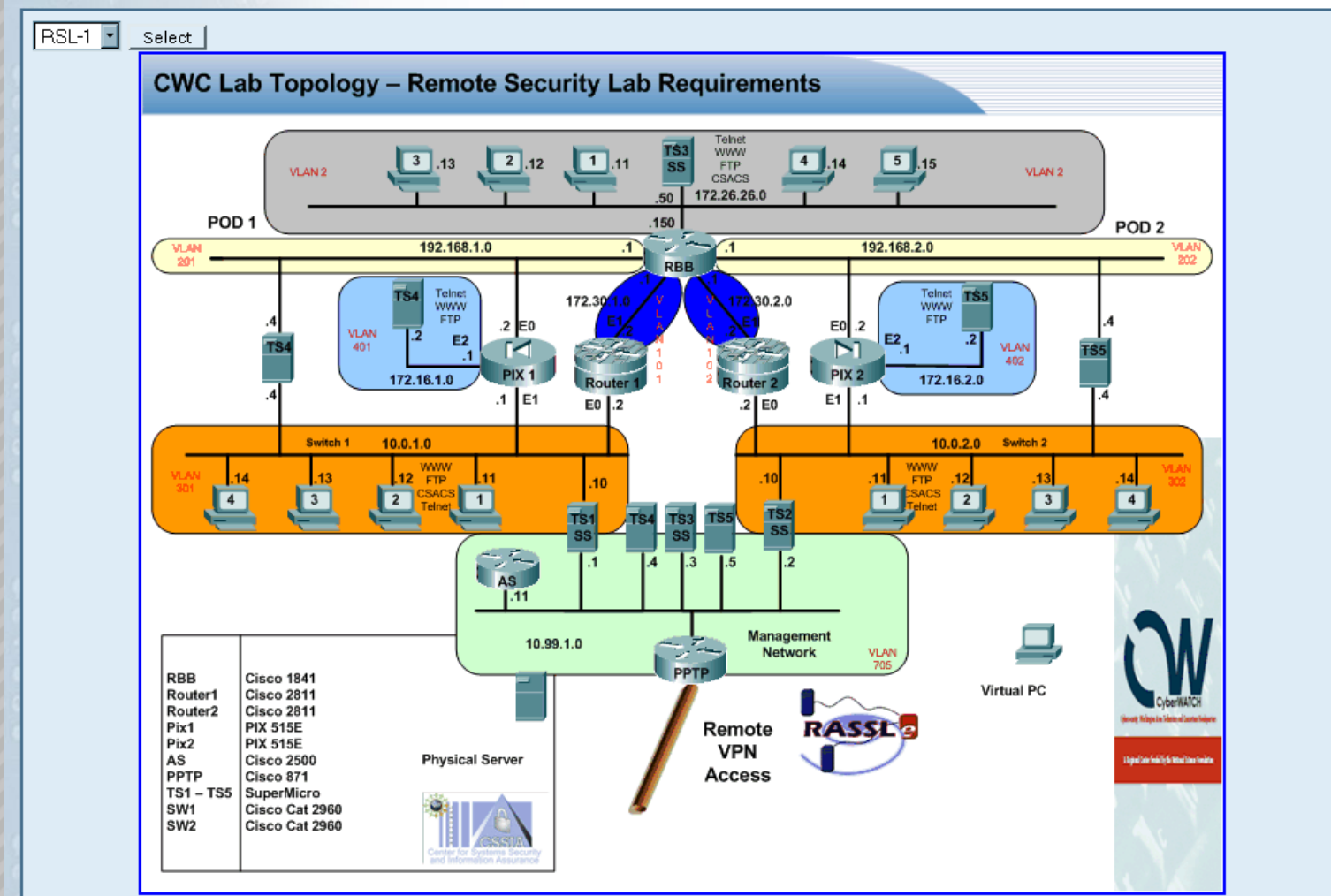 - Capitol College
  - UMUC
  - George Washington

Virtual Lab

David Hall

The "Logical Topology" of the Remote Virtual Lab is only a click away on the Internet.

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Virtual Lab Development

- Montgomery College held a special training of trainers session in June 2008.
- This session provided training in:
  - Planning and implementation of security policy.
  - Router, switch, and hardware firewall management.
  - Intermediate router, switch, and hardware firewall configuration.

Virtual Lab Use
Information Gained

- Cisco instructors can use the lab equipment easily; non-Cisco instructors had difficulty.
- Lab/Class set-up was complex for instructors and student users
- Several client-side connectivity problems

Virtual Lab Use
Challenges

- Original lab design is mapped to Intermediate/Advanced Cisco Security training; these courses are "optional" in CyberWATCH curriculum

- Lab needs to be able to address lower-level technical classes: i.e., Networking 4 (Security), Security+, etc.

- Lab needs to expand Operating Systems available to make it useful for a larger variety of security scenarios

Virtual Lab Use
Solutions

- For non-Cisco instructors, easy-to-implement Software firewall programs have been added to all virtual XP systems in the Lab

- A variety of additional software applications have been added

- Additional, easy-to-use, web-interface hardware firewalls are being added to the infrastructure in April 2009.

Virtual Lab Use
Solutions

- A variety of additional software applications have been added including freeware versions of:
  - ZoneAlarm
  - WireShark
  - PGP
  - Putty
  - SNORT
- We can customize desktop software on request as long as intellectual property rights and restrictions are observed.

Virtual Lab Use
Solutions

- Lab/Class set-up was complex for instructors and student users
- Lab/Class set-up has been streamlined.
    - Institution schedules time on the Virtual Lab
    - All user names and passwords are immediately available.
    - All users need do is create a VPN connection on their Windows system and log in at the scheduled time.
- Several client-side connectivity problems
    - PPTP connections blocked by user institutions
    - Double NAT restricts user connectivity

Virtual Lab Use
Solutions

- Curriculum challenges
  - Original lab design is mapped to Intermediate/Advanced Cisco Security training; these courses are "optional" in CyberWATCH curriculum
  - Lab needs to be able to address lower-level technical classes: i.e., Networking 4, Security+, etc.

- New Cisco Networking 4 curriculum includes scenarios designed for use on Virtual Lab

- Non-Cisco hardware and software is being added for Security+ and other courses

Virtual Lab Use
Solutions

- Curriculum challenges
  - Lab needs to expand Operating Systems available to make it useful for a larger variety of security scenarios
- Ubuntu Operating System is currently being added to Virtual Lab to provide LINUX-based platform for security scenarios

Virtual Lab Use
Solutions

- Connectivity concerns for larger, more diverse clientele and capability for obtaining more granular statistical data on Virtual Lab users are addressed in the Continuation Grant Proposal

Virtual Lab Use

- In order to increase avenues of use of the Virtual Lab:

  - Montgomery College in cooperation with Bowie State University is making the Virtual Lab available via the CyberWATCH Underground

  - Bowie State University is creating a number of new scenarios for use on the Virtual Lab

Virtual Lab Courseware

- Due to upgrades, the lab is now useful for the following CyberWATCH Courses:
  - CW 160 Security+ (New)
  - CW 251 Networking 4 (New)
  - CW 225 Hardening the Infrastructure
  - CW 235 Network Defense and Countermeasures
  - CW 260 Firewalls
  - CW 261 Intrusion Detection Systems
  - CW 270 Information Security Capstone

Virtual Lab Use

June 2008 – June 2009

- Capitol College—

- UMUC—

- Harford—

- Whatcom CC—

- PGCC—

- Montgomery College—

The "real" equipment of the "virtual" lab:

Routers,

Firewalls,

Switches,

VPN Devices,

and

Servers.

Faculty Professional Development

Margaret Leary

Accomplishments

- In total, more than 46 activities have been offered, with more than 421 faculty participants

- PD Course Proposal Process

- Leveraging relationships with text-book publishers to obtain free or significantly discounted training materials

- Upgraded lab memory at NVCC - Arlington Center with in-kind funds from NVCC

- Added lab at Alexandria with in-kind funds from NVCC

  – Newer, more capable PCs to meet more challenging workshop content

  – Virtualization server equipment recently ordered to support remote lab activities that will be shared with CyberWATCH

- Based on survey results and assessments during training, professional development courses have been offered to support a wide range of competencies and interests.
  - TCP/IP basics training to strengthen foundational knowledge
  - Advanced courses on using Wireshark to enhance existing technical skills
  - Training, (CyberLaw and Forensics), to address new topics under consideration at member institutions
- Training incorporates industry certification courses, wherever possible (i.e. Certified Ethical Hacker, Certified Secure Programmer)

New/Continuing Efforts

- Growing the Faculty Professional Development Committee
- Develop assessment metrics to directly measure training effectiveness
- Leverage online e-learning tools, such as Second Life, to provide training to a geographically dispersed consortium body
- Examine leveraging Educause's partnership with SANS
- Possible partnership with EC-Council
  - Allow member institutions to offer EC-Council certifications
  - Provide a revenue stream for CyberWATCH

Professional Development Activities

- One-day Workshops:
  - Intrusion Detection Systems (IDS) – June 2008 (12)
  - Wireshark (2 sessions, Feb. and April 2009 , both with over 24 attendees)
- Week-Long Workshops:
  - Certified Ethical Hacker (CEH) – 2 sessions August 2008 and January 2008 (36 total)
  - Secure Programming – April 2009 (18 enrolled)
- Other Events:
  - ITAA IdentEvent Conference (2+3)
  - Computer Security Institute (CSI) Conference (6+1)

2nd Life

- Phase I will be complete by Fall 2009
  - Faculty training
  - Classroom space for training partners
  - Advisory Board Members will be provided space to advertise security products/services and job openings
  - Virtual Job Fairs
  - Alumni Café
  - Conference Center
  - Development Land for Incident Response Training/Security Audit Labs

www.humec.k-state.edu

Faculty Graduate Program

Sally Sullivan

Building a Cadre of IS Faculty

- 26 courses taken April, 2008-April, 2009
- One graduate certificate earned at UMUC
- 8 active participants
- All are pursuing Master's or Doctorate degrees
- One new applicant will be taking courses in disaster recovery and risk management
- Diverse institutions represented both in the participants and institutions attended
- 3 additional faculty members from Capitol College expected before Summer, 2009

Online Course Format

- A number of graduate program participants are taking online courses in Capitol College

- Synchronous instruction is used for all Capitol online courses (using Centra)

- Instructors benefitting from this instruction have begun applying it in their own courses

- The synchronous instruction adds interaction

- CyberWATCH benefits as more online instruction is added to programs

CISSP Preparation

- CyberWATCH recognizes the importance of professional credentials for faculty

- Almost 30 faculty have participated in Capitol College's CISSP prep course since CW began

- At least 5 faculty have become CISSPs

- Faculty involved in the program have benefited from a review of all 10 domains, deepening their expertise

Internship Activities

Sally Sullivan

Internship Activity

- Multifaceted approach has begun to produce results:
    - Skill sets printed on bookmarks
    - 5 institutions have placed CW students into internships
    - Mentoring process begun
    - Information Security offices at colleges have hired CW interns

- Results continued
    - Leveraging existing summer internships such as JEOM
    - Temporary reassignment into IS/IA function of students who are current employed
    - AACC produced internship manual
- The foundation has been built;
- Coordinator position will help standardize process

Exploring Placement Strategy Options

Costis Toregas

Options for CYBERWATCH student placement

- Cyber Job Fair
- Job Fair element in CCDC
- Consortium and Advisory Board dialog

Internship cyber Job Fair

- Held on October 28, 2008
- Used advanced on-line synchronous conferencing system Webex provided by CISCO
- Organized and stored resumes through interviewexchange.com
- 9 students registered, 5 participated from 4 schools, one company (Assured Decisions) provided presentation and offers

Job Fair at 2009 Collegiate Cyber Defense Competition

- Held in conjunction with 2009 CCDC in Maryland

- 12 students from 3 schools participated, and 2 employers made presentations (SAIC, MITRE)

- Follow up and interest continues (Northrop Grumman requested resumes through White Wolf)

Sponsored by The National Science Foundation

Consortium and Advisory Board presentations

- Organizing placement activities in the future requires network-intensive activities

- Importance of collective support from all stakeholders to contribute students (from academic institutions), jobs (from industry leaders) to a CyberWATCH event

- No agreements reached yet on how to accomplish this

CyberWATCH

Final Observations

- Organizing for the future requires network activities

- Importance of collective agreement from all stakeholders to contribute students (from academic institutions), jobs (from industry leaders) to a CyberWATCH event is vital

- No agreements reached yet

Suggestions for implementation

- Develop on-line repository for resumes of students using CyberWATCH branded collateral material

- Encourage industry partners to start early and document / offer internship and full time job opportunities

- CS/IA faculty and HR professionals must work together in each institution on job preparations

- Commit staff to coordinate Job Support across all institutions

K-12 Partnership Programs

Davina Pruitt-Mentle

2008 Cyberethics, Cybersafety & Cybersecurity (C3) Conference

- 266 participants from MD, VA, NJ and DE school district
- Representatives from Higher Education, Non-profits, Business and Government/Law Enforcement

- Elizabeth Lodal-Virginia Education Commission of the States Commissioner

- Maintaining a Safe IT Environment When Your Child Knows More About the Technology Than You Do
  – Jane Scott Norris, CISSP-ISSAP, ISSMP, CAP, CISM-Co-Chair (ISC)² Government Advisory Board for Cyber Security

- The National Agenda for K12 Security
  – Michael Kaiser, Executive Director,
    National Cyber Security Alliance

C3 Conference Cybersecurity Highlights

- Students and Technology: Facing Facebook Realities

- What the Research is Telling Us

- Hands on Safety and Security How to's—Bring Your Laptop

- What Do Strong Acceptable Use Policies Have to Offer?

IT/IA/DF Guidance Counselor Workshop

A one day workshop is planned for May 7th, 2009.

The workshop will be held at the National Electronics Museum in Linthicum, MD.

See Handout

2008 Summer Young Scholars Program

- 2 programs-2 locations
- 58 students in 2 counties

Internships/Job Shadowing

APPTIS

INGENIUM Corporation
The National Academies

US Department of Transportation

BAE Systems

US Department of Energy

Cool Careers in Cybersecurity

October 2008

- 35 middle school girls from Prince George's County Public schools
- 17 high school students (N: F=6; M=11) from Fairfax County VA
- Hands-on activities and an opportunity to talk with professionals in the field.
- Learned first hand from IT/IA experts about career opportunities and pathways in Cybersecurity

Elementary School After-School Program

- Dayton Oaks Elementary School, in Howard County

- Mondays after school

- 63 students
    - 23 (Spring 2008)
    - 40 (Fall/Spring 2008/2009)

K-12 Impact to Date

K12 Impact to Date
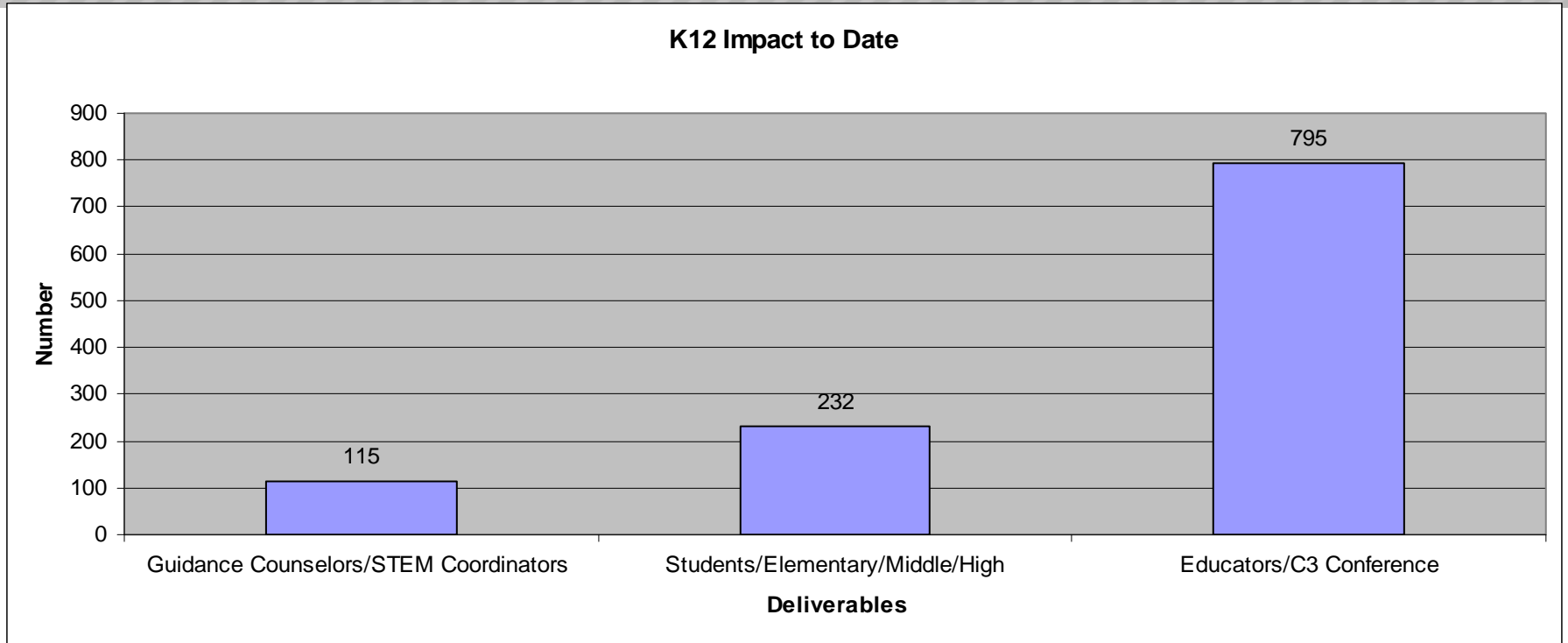
Successful Model

Dissemination: Successful Model

- Summer Program 2009
  - 5 Programs ~25 students each
  - Additional interest from Baltimore County, Baltimore City and MCPS
  - Replication in VA & LA
- Materials Development
  - Digital Forensics Exercises
  - Cryptography Exercises
- After School Program
  - Elementary & Middle School
- Cool Careers in Cybersecurity for Girls
  - Regional Event
  - Part of the National Girls Collaborative Project

Security Awareness

Sally Sullivan

Poster Contests

- 2008 contest winning posters have been effectively used in displays, on website, and in bookmarks

- 2009 contest is in conjunction with EDUCAUSE and includes posters and videos

- PGCC and NVCC held preliminary contests to help motivate students to enter both those contests and the national one

Community Outreach

- To promote security awareness in the community, students have helped with users' computers

  – NVCC sponsored IT students removing spyware and viruses

  – PGCC's Engineering Technology students did hardware repair but found that most problems presented to them at the event were of the spyware/virus variety

K-12 Efforts

- NCSA (National Cyber Security Alliance) and others sponsored a poster/video/podcast contest for K-12 students

- CyberWATCH helped promote and design the submission criteria for the contest

- CyberWATCH will also help in the judging process of the contest

Digital Forensics Lab

Davina Pruitt-Mentle

And

Robert Maxwell

- **Kickoff Event: October 22, 2008**
- Gerry Sneeringer, Director of Security, OIT
- Steven Shirley, Executive Director of Department of Defense Cyber Crime Center (DC3)
- Sgt. J. Casey from the Maryland State Police, Computer Crimes Section/Computer Forensics Lab
- Ajay Gupta, President of GSecurity, Inc.

Website Launched

- An examination of browser forensics, focusing on atypical browsers and alternative Operating Systems (OS)

- 20 participants

New Developments

Bob Spear

New Developments

- Membership in CompTIA, EC-Council, and ISSA-NOVA

- Coordinator of Member Services

- Sustainability

- Conclusions

Association Memberships/Affiliations

- CompTIA
  - Computing Technology Industry Association
  - IT industry focus
- EC-Council
  - International Council of Electronic Commerce Consultants
  - e-Commerce and e-Commerce security focus
- ISSA-NOVA
  - Northern Virginia Chapter of the Information Systems Security Association
  - Security focus

Association Memberships/Affiliations

- Members of these associations bring guest speakers to CW events, mentor students, sponsor internships, and participate in student competitions and job fairs.

- The associations gain access to the best and brightest IS/IA students.

- Specific advantages of each association follow

CompTIA Membership

- Certification Exams:
  - CompTIA A+
  - CompTIA Network+
  - CompTIA Security+
- CW members gain 15-20% discounts on exam vouchers, training materials, courses, and seminars
- Opportunity for each CW member institution to join CompTIA Learning Alliance (to become a testing site for administering CompTIA certification exams)

EC-Council Alliance

- [Still a work in progress]

- CW gains significant discounts on EC-Council training materials and trainings.

- CW institutions can grow the body of EC-Council-certified instructors.

- CW can offer EC-Council-approved trainings by using EC-Council-certified instructors (e.g., Certified Ethical Hacking course taught by Casey O'Brien)

ISSA-NOVA Alliance

- ISSA-NOVA is the largest chapter of ISSA (500 members)
- Excellent professional association for CW students

Coordinator of Member Services

- From 10 to 27 institutional members

- Numerous agencies and businesses

- Advisory Board from 15 to 26 members

- Growth expected to continue

- Full-time position (temporary, until continuation funding is assured)

- Recruitment (vacancy announcement) to be released this week

Sustainability:
RFP to develop a business plan

- Organizational and management structure (such as a not-for-profit corporation, either owned by or independent of Prince George's Community College)

- Identification of CW products and services

- Revenue streams versus pro bono activities

- Expansion of CyberWATCH membership (domestic and international)

Sustainability: RFP Timeline

- RFP issued April 1

- Bidders conference April 13

- Proposals due April 28

- Contract award expected May 15

- Deliverables due 6 months after contract award

Conclusions

- CW services can be of significant value to any participating institution (2-year or 4-year college or university, K-12 system, government agency, association, or private business).

- CW has the experience, the expertise, and the proven model to succeed.

- In three years, with your help (NSF, NVC, CW participants, faculty, and students) CW can grow exponentially, and can achieve our mission "to [dramatically] improve the quality and quantity of IS/IA professionals in the workforce".