The US Cyber Challenge

US Cyber Challenge:
Developing the Next Generation of Cyber Guardians

Karen S. Evans
National Director
FISSEA Conference

March 16, 2011

Agenda

- ☐ The Critical Shortage of Technical Talent

- ☐ Which skills matter most

- ☐ Can Competitions Find Talent

- ☐ The U.S. Cyber Challenge

How Critical is the Shortage?

□ Jim Gosler (first director of the CIA's Clandestine Information Technology Office) in a meeting in the Pentagon (October 08) with senior NSA, DoD, SANS and White House officials:

> *"The US has no more than 1,000 people with the advanced security skills to compete in cyberspace at world class levels – we need 20,000 to 30,000!"*

□ No one disagreed!

Which Skills Matter Most?

Setting the Stage

Subcommittee on Emerging Threats, Cybersecurity, and Science & Technology April 17, 2007 Chairman: Jim Langevin

"We don't know who's inside our networks. We don't know what information has been stolen. We need to get serious about this threat to our national security."

- ◻ State Dept witness: Don Reid, Senior Coordinator for Security Infrastructure

- ◻ Commerce Department witness: Dave Jarrell, Manager, Critical Infrastructure Protection Program

Starkly Contrasting Responses

Commerce

1. No idea when it got in, how it got in, or where it spread
2. Took 8 days to filter (ineffective)
3. Unable to clean the systems; forced to replace them
4. Do not know whether they have found or gotten rid of the infections

State

1. Detected it immediately
2. Put effective filter in place within 24 hours; shared filter with other agencies
3. Found two zero-days
4. Helped Microsoft and AV companies create patches and signatures
5. Cleaned infected systems, confident all had been found

What was the Difference?

- Was it tools? No
  - Almost same commercial tools – Commerce had more commercial IPS/IDS

- Was it skills? Yes
  - Commerce – only experience was firewall operations not even firewall engineering. No training other than prep for Security + and later for CISSP
  - State – experience and training in forensics, vulnerabilities and exploits, deep packet inspection, log analysis, script development, secure coding, reverse engineering. Plus counter intelligence. And managers with strong technical security skills

Which Skills Matter Most?

- Security skills:
  - System forensics; network forensics and deep packet inspection; Windows, UNIX, and PDA defensive configuration; log analysis; script development; exploits and penetration testing; secure coding; reverse engineering. Plus counter intelligence

- Foundations:
  - Networking and network administration; computer operations and system administration; Java and C/C+ programming including the 25 most dangerous programming errors

Prepare for Fast Growing Jobs

- Network, systems, and data communications analysts (53%)

- Computer software engineers: applications (34%)

- Computer software engineers: systems software (30%)

Great job opportunities: #2, 15 and 24 on the "30 Fastest Growing Occupations"

Employment Projections

EPP | FONT SIZE: ⊖ ⊕ PRINT:

Fastest growing occupations

This table also can be found in the article, "Occupational Employment Projections to 2018," published in the *November 2009 Monthly Labor Review*.

Other available formats: [PDF] [XLS]

Table 1.3 Fastest growing occupations, 2008 and projected 2018 (Numbers in thousands)

2008 National Employment Matrix title and code		Major occupational group	Employment		Change, 2008-18		Median Annual wage quartile, 2008	Most significant source of postsecondary education or training
			2008	2018	Number	Percent		
Biomedical engineers	17-2031	Professional and related	16.0	27.6	11.6	72.02	VH	Bachelor's degree
Network systems and data communications analysts	15-1081	Professional and related	292.0	447.8	155.8	53.36	VH	Bachelor's degree
Home health aides	31-1011	Service	921.7	1382.6	460.9	50.01	VL	Short-term on-the-job training
Personal and home care aides	39-9021	Service	817.2	1,193.0	375.8	45.99	VL	Short-term on-the-job training
		Management						

The U.S. Cyber Challenge
Identifying and Nurturing
10,000 Very Talented People

Q&A to Prove the Value

Q. You're in your senior year in high school – had you already taken computer courses at school?
A. I enrolled to take Introduction to Programming this year, but they cancelled it; they couldn't find a suitable teacher.

Q. How do people demonstrate and test their skills if they do not have the opportunity to play in the NetWars rounds?
A. There aren't many options for kids with lots of cyber skill to be able to exercise and further develop those skills. Most would just simply target random servers and hack illegally, so it was great that I found NetWars.

Who is supporting the U.S. Cyber Challenge?

Proposed U.S. Cyber Challenge Framework

K-12

Communities

Colleges

Universities

Virtual Community "Future Cyber Professionals"

Competitions

Camps

Weekend Programs

Pathway to: Scholarships Internships Jobs

Talent Bank

Skills Needed

Public Sector

Private Sector

Critical Infrastructure

Tech Industry
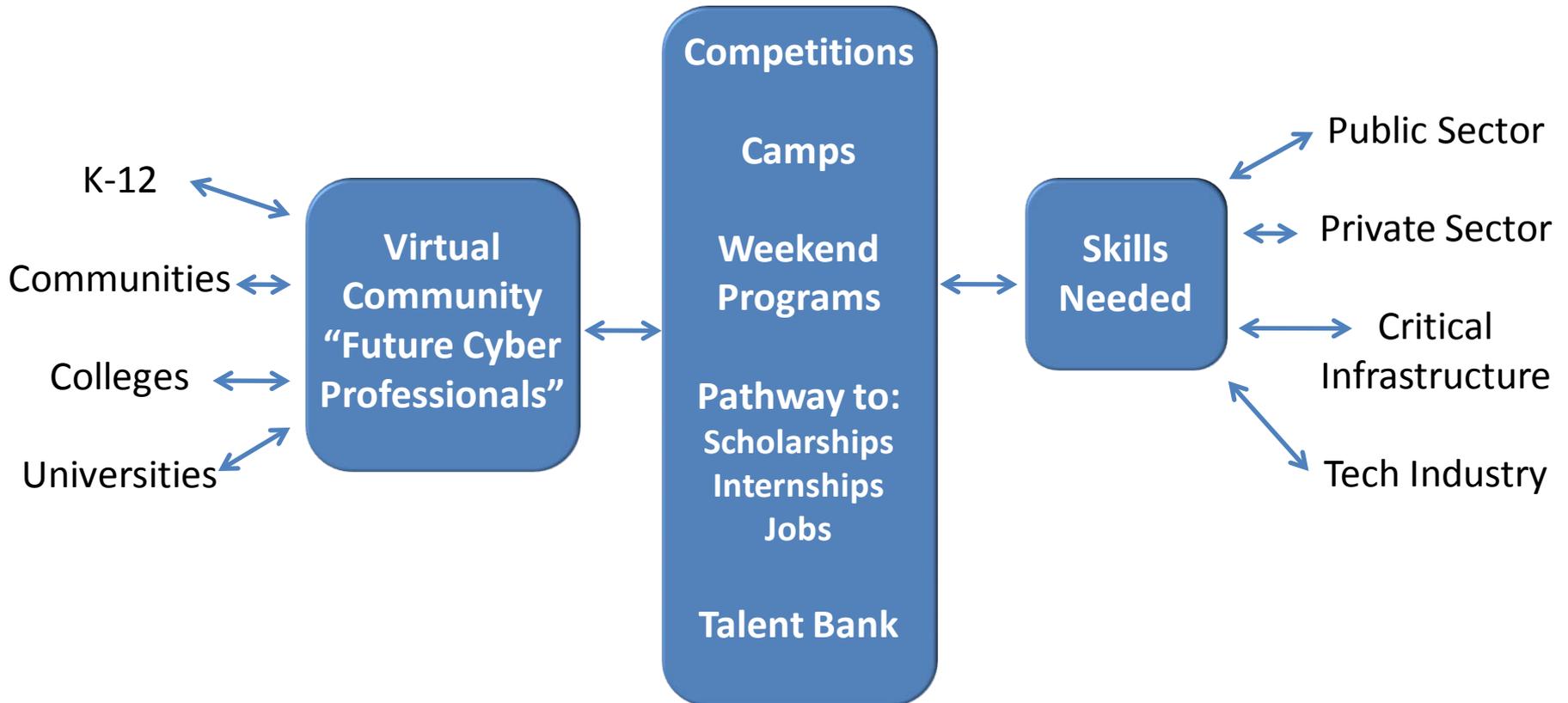
Activities

STEP 1
- Forensics Challenge (DoD Cyber Crime Center)
- CyberPatriot Defense Competition (AFA)
- NetWars Challenge (SANS)
- Cyber Quest (SANS)
- Cyber Foundations (SANS and CKSF.org)

STEP 2
- Cyber Camps
- Courses and Exercises
- Tournaments

STEP 3
- Internships
- Scholarships

STEP 4
- Connect with Employers
- Talented Cyber Security People

Cyber Security Foundations

- A series of quizzes (March/April 2011)

- Tutorials with videos and questions on a special web site

- Networking; systems (including finding hidden bad stuff), secure programming

- Prizes, awards and recognition

- Progressively more challenging competitions to develop and demonstrate your skills

- 18 States with 135 schools registered

Cyber Quest Competition

- A first quest in a series: March 16

- Target system to analyze

- Demonstrates your ability in vulnerability analysis skills; forensic analysis; packet capture analysis

- Prizes, awards and recognition

- Progressively more challenging competitions to develop and demonstrate your skills

- Challenge for Cyber Camp invitation: April 18
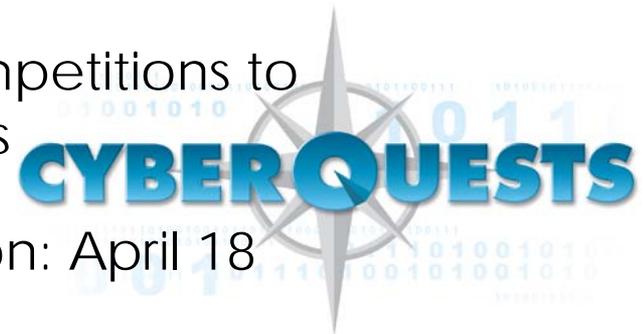
Building the Highway: Action Plan

- Encourage talented kids to compete

- Support a high school program

- Serve as a teacher/aid at the summer camps

- Build a competition

- Support a college team

- Sponsor a summer camp

- Sponsor a college

- Sponsor the U.S. Cyber Challenge

TAKE THE CHALLENGE

http://www.uscyberchallenge.org