cyber
Want job security? Try cybersecurity

OIG
Top Management and Performance Challenges Facing the Department of Justice
November 10, 2015

Job Market Intelligence: Cybersecurity Jobs, 2015
Table D4. Employment of New PhD Recipients By Specialty

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Artificial Intelligence</th>
<th>Computer Supported Cooperative Work</th>
<th>Database/Information Retrieval</th>
<th>Graphic/Visualization</th>
<th>Human-Computer Interaction</th>
<th>High-Performance Computing</th>
<th>Information Assurance/Security</th>
<th>Information Systems</th>
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<tr>
<td>Tenure-track</td>
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Table B7. Bachelors Degrees Awarded by Gender and Ethnicity, From 125 Departments Providing Breakdown Data

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<thead>
<tr>
<th></th>
<th>CS</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>CE</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>I</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Ethnicity Totals</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Fem</td>
<td>N/R</td>
<td>% of M</td>
<td>% of F</td>
<td>Male</td>
<td>Fem</td>
<td>N/R</td>
<td>% of M</td>
<td>% of F</td>
<td>Male</td>
<td>Fem</td>
<td>N/R</td>
<td>% of M</td>
<td>% of F</td>
<td>Male</td>
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<tr>
<td>Nonresident Alien</td>
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<td>168</td>
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<td>13</td>
<td>139</td>
<td>26</td>
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<td>12</td>
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<td>31</td>
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<td>0</td>
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<td>1</td>
<td>1</td>
<td>0</td>
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<td>Asian</td>
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<td>421</td>
<td>60</td>
<td>20</td>
<td>32</td>
<td>413</td>
<td>76</td>
<td>10</td>
<td>25</td>
<td>34</td>
<td>301</td>
<td>103</td>
<td>0</td>
<td>15</td>
<td>20</td>
<td>2,982</td>
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<td>46</td>
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<td>5</td>
<td>3</td>
<td>38</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>152</td>
<td>54</td>
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<td>8</td>
<td>11</td>
<td>50</td>
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<td>Native Hawaiian/Pacific Island American</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>White</td>
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<td>539</td>
<td>225</td>
<td>60</td>
<td>41</td>
<td>845</td>
<td>83</td>
<td>42</td>
<td>51</td>
<td>37</td>
<td>1,200</td>
<td>265</td>
<td>60</td>
<td>51</td>
<td>18</td>
<td>8,123</td>
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<td>Multiracial/Not</td>
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<td>34</td>
<td>5</td>
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<td>145</td>
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<td>2</td>
<td>9</td>
<td>7</td>
<td>223</td>
<td>47</td>
<td>0</td>
<td>11</td>
<td>9</td>
<td>1,105</td>
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<tr>
<td>Total Res &amp; Ethnicity Known</td>
<td>8,175</td>
<td>1,303</td>
<td>383</td>
<td>162</td>
<td>74</td>
<td>1,651</td>
<td>222</td>
<td>74</td>
<td>1</td>
<td>20</td>
<td>2,008</td>
<td>516</td>
<td>1</td>
<td>14,333</td>
<td></td>
<td></td>
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<tr>
<td>Resident, Ethnicity Unknown</td>
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<td>54</td>
<td>10</td>
<td>36</td>
<td>0</td>
<td>349</td>
<td>54</td>
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<td>54</td>
<td>10</td>
<td>36</td>
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<td>576</td>
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<tr>
<td>Not Reported (N/R)</td>
<td>1,821</td>
<td>344</td>
<td>147</td>
<td>26</td>
<td>29</td>
<td>346</td>
<td>29</td>
<td>29</td>
<td>34</td>
<td>29</td>
<td>195</td>
<td>37</td>
<td>29</td>
<td>34</td>
<td>29</td>
<td>2,328</td>
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<tr>
<td>Gender Totals</td>
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<td>1,701</td>
<td>182</td>
<td>83</td>
<td>57</td>
<td>437</td>
<td>55</td>
<td>57</td>
<td>43</td>
<td>57</td>
<td>2,110</td>
<td>537</td>
<td>23</td>
<td>17,237</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% of M and % of F columns are the percent of that gender who are of the specified ethnicity, of those whose ethnicity is known.
The Future Workforce -- The High School Pipeline:
AP Mathematics and Science Exams 1997-2009

- Calculus
- Biology
- Statistics
- Chemistry
- Physics
- Environmental Science
- Computer Science

AP Exam Takers, Class of 2013

RACE/ETHNICITY PERCENTAGES:
- A American Indian/Alaska Native: 54.2%
- B Asian/Asian American/Pacific Islander: 9.0%
- C Black/African American: 28.8%
- D Hispanic/Latino: 5.2%
- E White: 1.4%
- F Other: 0.4%
- G No Response: 0.2%

GENDER:
- 19% Female
- 81% Male

Source: College Board Exam Volume Data
diversity

equality

viability

quality
Core Hours in Knowledge Areas

An overview of the number of core hours (both Tier-1 and Tier-2) by KA in the CS2013 Body of Knowledge is provided below. For comparison, the number of core hours from both the previous CS2008 and CC2001 reports are provided as well.

<table>
<thead>
<tr>
<th>Knowledge Area</th>
<th>CS2013 Tier1</th>
<th>CS2013 Tier2</th>
<th>CS2008 Core</th>
<th>CC2001 Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI-Algorithms and Complexity</td>
<td>19</td>
<td>9</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>AI-Architecture and Organization</td>
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<td>16</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>CI-Computer Science</td>
<td>57</td>
<td>4</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>DS-Discrete Structures</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>GV-Graphics and Visualization</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>HN-Human-Computer Interaction</td>
<td>3</td>
<td>6</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>IAS-Information Assurance and Security</td>
<td>3</td>
<td>6</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
self-selected student body
established habits & limited runway
security is not an elective
security can be hard
security can be hard
perceptions & realities
A team competing in the CTF competition at DEF CON 17 in Las Vegas, Nevada, United States.

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rule interpretation & testing

identifying motivations

strategic thinking

moves & countermoves
cybersecurity concepts are game concepts
authentic problems

counterfactual thinking

social & fun

engaging & immersive
This is my super secure password storage center.

I was tired of insecure systems that had only ONE password protecting ALL the passwords.

In my system, you must get through all the base authentications to even GET to the per-password security. Each password is secured by a different password, but you can make it less secure than normal because it's so hard to get in.

Enter Access Code Below:

1 2 3

4 5 6

7 8 9

0
Access Denied, Please Try Again Maintenance mode over, password bug fixed.

SHA-1 HASHES DO NOT MATCH
'943f264d7534aad8d4f5fdda2ed7e16d088f56de' != '77361fca965b3e53ff81a5d48525ca8adb8a9b87'

Password: ********
Submit
```python
import hashlib

f = open("/usr/share/dict/words")
for guess in f.readlines():
    digest = hashlib.sha1(guess).hexdigest()
    if digest == "2d1b30542e3bcc8467096e4407e1276d026e4169":
        print "Found it!", guess
```

- **import**
- **hashlib**
- **f = open**
- **"/usr/share/dict/words"**
- **for**
- **guess in f.readlines()**
- **digest = hashlib.sha1(guess).hexdigest()**
- **if digest == "2d1b30542e3bcc8467096e4407e1276d026e4169"**
- **print**
- **"Found it!", guess**
“wouldn’t be as fun without the game”

“hacking doesn’t mean being amoral”

“opens an entirely new world”

“I want to stay in the major”

“I have a power that can lead to the greater good”
behaviors

physical security

caution & curiosity

thoughtful apathy
accessible
social
unobtrusive
modest
d00x3d!
a network security game
fried chicken
Source materials for [d0x3dl], a network security game.

- 20 commits
- 1 branch
- 0 releases
- 3 contributors

**branch: master**

- **d0x3d-the-game**

Added print-and-play Scribus and PDFs. These have better cut lines th...
Finally, my printed-at-home @dox3d set is ready for play. :-) pic.twitter.com/wdVW5hhO
1200+ sales
Introduction to Digital Assets

INTRODUCTION

One goal of network security is to protect the information, or data, we value. These data may represent a variety of things, ranging from the last four digits of your social security number to the photos for a new cutting-edge invention. We also value data in various ways.

In the game [d0x3d!], the objective is to recover four stolen “digital assets,” namely: authentication credentials, financial data, intellectual property, and personally identifiable information. In this lesson—we intend to be used prior to and after playing our game—we explore the idea of digital assets in more depth, to better appreciate the importance of securing the data we value in our own lives. It is intended to be taught over two 50 minute class periods.

SUMMARY

Students will learn about valued, digital data and relate them to their lives and the real world.

Objectives

1. Students will be able to define what a digital asset is, generically.
2. Students will be able to describe some characteristics of the four types of digital assets present in the game [d0x3d!].
3. Students will be able to give some examples of digital assets in their own lives.
4. Students will be able to describe and compare scenarios where digital assets have been compromised, in terms of potential effects or damages to the real world.

Standards

- (CCSS.ELA-Literacy.CCRA.W.1) Write arguments to support claims in an analysis of substantive copies of texts using valid reasoning and relevant evidence.
- (CCSS.ELA-Literacy.CCR.11-12.3) Work with peers to promote civil, democratic discussions and decision-making on clear goals and deadlines, and establish individual roles as needed.
- (CCSS.ELA-Literacy.RI.11-12.7) Cite strong and thorough text evidence to support analysis of text's structure, style, and the individual.
- (MeTeRL Technology Standard 3, Grade 9-12)
challenges

terminology

student needs

educator needs

assessment
(shameless plug)
what can you do?
thank you