Core Challenges in the Market for Cybersecurity Jobs

BHEF National Cybersecurity Workforce Summit

Matt Sigelman, CEO Burning Glass Technologies
Core Challenges for the Cybersecurity Job Market

Our training systems – both from institutions and employers – are not well set up to provide the cybersecurity talent employers and government need.

> There are significant skill gaps in the cybersecurity job market.

> The level of experience and specialized knowledge required in cybersecurity jobs is resulting in supply chain bottlenecks.

> Ensuring sufficient supply of talent to the market requires the development of better aligned education and training pipelines.
The Cyber Market: Heavy Demand, Insufficient Supply

The Market for Cybersecurity Jobs Is Large and Growing

- In 2013, there were 209,749 postings for cybersecurity-related jobs nationally. Cybersecurity jobs account for nearly 10% of all IT jobs.
- Cybersecurity postings have grown 74% from 2007-2013. This growth rate is over 2x faster than all IT jobs.

Demand for Cybersecurity Talent Is Outstripping Supply

- Cybersecurity job postings took 24% longer to fill than all IT job postings and 36% longer than all job postings.
- The demand for cybersecurity talent appears to be outstripping supply. In the US, employers posted 50,000 jobs requesting CISSP, recruiting from a pool of only 60,000 CISSP holders.

Growth in Job Postings (2007-2013)

- All IT Postings: 33%
- Cybersecurity Postings: 74%

Posting Duration (2013)

- All IT Postings: 36 days
- Cybersecurity Postings: 45 days
Filling Cybersecurity Jobs Requires High Salaries

Cybersecurity Jobs Pay a Premium

On average, cybersecurity salaries offer a premium of over $15,000 over the salaries for IT jobs overall.
A Growing Span of Industries Demand Cyber Talent

- Professional Services, Manufacturing, and Finance are the leading industries for cybersecurity professionals.
- The share of cybersecurity jobs coming from the Manufacturing & Defense, Public Administration, and Retail Trade industries is increasing over time compared to other industries.

<table>
<thead>
<tr>
<th>Industry Sector</th>
<th>% of Cybersecurity Postings</th>
<th>Number of Cybersecurity Postings (2013)</th>
<th>2010-2013 Postings Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Services</td>
<td>38%</td>
<td>80,446</td>
<td>29%</td>
</tr>
<tr>
<td>Manufacturing &amp; Defense*</td>
<td>14%</td>
<td>28,331</td>
<td>16%</td>
</tr>
<tr>
<td>Finance and Insurance</td>
<td>12%</td>
<td>24,145</td>
<td>89%</td>
</tr>
<tr>
<td>Information</td>
<td>8%</td>
<td>15,820</td>
<td>36%</td>
</tr>
<tr>
<td>Health Care</td>
<td>6%</td>
<td>12,257</td>
<td>73%</td>
</tr>
<tr>
<td>Public Administration</td>
<td>5%</td>
<td>11,204</td>
<td>N/A**</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>5%</td>
<td>10,203</td>
<td>94%</td>
</tr>
<tr>
<td>Other</td>
<td>13%</td>
<td>27,384</td>
<td>N/A**</td>
</tr>
</tbody>
</table>

*Manufacturing Sector includes services divisions of a number of defense contractors (e.g. Raytheon) and computer manufacturers (e.g. Hewlett Packard).
** 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.
MA Cybersecurity: Top Employers

Top Employers by Industry Sector
(Min 10 postings in 2013)

Professional, Scientific and Technical Services
• Lincoln Laboratory
• PricewaterhouseCoopers
• Deloitte
• Jacobs Engineering Group
• Ernest & Young
• McGladrey
• Accenture
• Mitre Corporation
• Sapient

Manufacturing
• Raytheon
• General Dynamics
• Hewlett-Packard
• Danaher (Arbor Networks)

Finance and Insurance
• State Street Bank
• Citizens Financial

Information
• EMC
• Time Warner
• Verizon
• AT&T

Retail
• TJX Companies
• Staples

Government
• Commonwealth Of Massachusetts
Driving The Gap Is Widening Demand for Cyber Talent

### Top States by Total Postings*

<table>
<thead>
<tr>
<th>State</th>
<th>Total Postings</th>
<th>Postings/10,000 Residents</th>
<th>% Growth (2007-2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>27,084</td>
<td>7.1</td>
<td>64%</td>
</tr>
<tr>
<td>Virginia</td>
<td>20,507</td>
<td>25.1</td>
<td>53%</td>
</tr>
<tr>
<td>Texas</td>
<td>16,376</td>
<td>6.3</td>
<td>97%</td>
</tr>
<tr>
<td>New York</td>
<td>12,405</td>
<td>6.3</td>
<td>59%</td>
</tr>
<tr>
<td>Illinois</td>
<td>11,136</td>
<td>8.6</td>
<td>116%</td>
</tr>
<tr>
<td>Maryland</td>
<td>10,627</td>
<td>18.1</td>
<td>94%</td>
</tr>
<tr>
<td>Florida</td>
<td>7,923</td>
<td>4.1</td>
<td>46%</td>
</tr>
<tr>
<td>Georgia</td>
<td>7,539</td>
<td>7.6</td>
<td>214%</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>7,107</td>
<td>10.7</td>
<td>76%</td>
</tr>
<tr>
<td>New Jersey</td>
<td>6,814</td>
<td>7.7</td>
<td>12%</td>
</tr>
<tr>
<td>North Carolina</td>
<td>6,676</td>
<td>6.8</td>
<td>129%</td>
</tr>
<tr>
<td>Colorado</td>
<td>6,039</td>
<td>11.6</td>
<td>158%</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>5,630</td>
<td>4.4</td>
<td>22%</td>
</tr>
<tr>
<td>Washington</td>
<td>5,444</td>
<td>7.9</td>
<td>76%</td>
</tr>
<tr>
<td>Ohio</td>
<td>5,086</td>
<td>4.4</td>
<td>34%</td>
</tr>
</tbody>
</table>

*See Appendix 1 for state-level data tables on total postings and postings growth.

Cybersecurity Job Postings in 2013
By State

Darker blue = Greater number of postings

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> Ensuring sufficient supply of talent to the market requires the development of better aligned education and training pipelines.
Cyber Jobs Require Significant Education & Experience

- 84% of cybersecurity postings specify at least a Bachelor’s.
- 2/3 of cybersecurity postings require at least 4 years of experience.

### Minimum Education Level

- Bachelor’s (78%)
- Associate’s (16%)
- Master’s (6%)

### Minimum Experience

- 0-2 years (7%)
- 2 to 4 years (25%)
- 4 to 7 years (39%)
- 7+ years (28%)
Cyber Roles Require Advanced Skills Across Domains

Cybersecurity Skills Profile

Networking Security
- Information Security
- Network Engineering
- System Administration
- Firewalls
- Cryptography
- TCP/IP
- VPN

Programming Languages
- JAVA
- SQL
- Oracle
- Perl

Business and Domain Knowledge
- HIPAA
- Risk Assessment
- Disaster Recovery Planning
- Business Process

Certifications
- CISSP
- CISA
- Security+
- CISM
- GIAC

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Cyber Jobs Are Heavily Certificated

Certification requirements are more common in cybersecurity roles than in IT generally.

- 51% of all cybersecurity positions request at least one of the certifications listed below.
- 14% of all IT positions request a certification of any kind.

<table>
<thead>
<tr>
<th>Certification*</th>
<th>% of Cybersecurity Postings</th>
<th>Number of Cybersecurity Postings (2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISSP</td>
<td>24%</td>
<td>49,522</td>
</tr>
<tr>
<td>Certified Information System Security Professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CISA</td>
<td>16%</td>
<td>33,290</td>
</tr>
<tr>
<td>Certified Information Systems Auditor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security+</td>
<td>8%</td>
<td>17,019</td>
</tr>
<tr>
<td>Certified Information Security Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CISM</td>
<td>7%</td>
<td>15,083</td>
</tr>
<tr>
<td>Certified Information Security Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GIAC Security Essentials</td>
<td>3%</td>
<td>5,639</td>
</tr>
<tr>
<td>CIPP</td>
<td>2%</td>
<td>4,168</td>
</tr>
<tr>
<td>Certified Information Privacy Professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSCP</td>
<td>2%</td>
<td>4,039</td>
</tr>
<tr>
<td>Systems Security Certified Practitioner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GIAC GCIIH</td>
<td>2%</td>
<td>3,163</td>
</tr>
<tr>
<td>GIAC Certified Incident Handler</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Certification requirements are not mutually exclusive
Hefty Requirements Make These Jobs Hard-to-Fill

High skill occupations – those that have high education and experience requirements – are harder for employers to fill.
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**IT Functional Occupation Groups**

70% of IT jobs are in networking and database occupations – but there’s little correspondence with higher education programs of study.

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**Occupational Hierarchy**

- **All IT Jobs**
  - **Networking/Support**
    - 46% of IT Jobs
    - Sample Occupations
      - Computer Support Specialist
      - Systems Analyst
      - Network/Systems Admin
  - **Development**
    - 36% of IT Jobs
    - Sample Occupations
      - Software Engineer
      - Web Developer
      - UI/UX Designer
  - **Database Administration**
    - 13% of IT Jobs
    - Sample Occupations
      - Business Intelligence Analyst
      - Database Administrator
      - Data Mining Analyst
  - **Management**
    - 4% of IT Jobs
    - Sample Occupations
      - IT Project Manager
      - Chief Information Officer

Data reflect national IT job postings in 2013.
Cybersecurity & Networking Career Ecosystem

Advanced Networking and Cybersecurity
(Information Security Engineers & Network Engineer)

Mid-Level Networking
(Network Administrator & System Analyst)

Entry Level Networking and Support
(Computer User Support & Computer Network Support)

Upward Advancement

BA Direct Entry

Sub-BA and BA Direct Entry
Driving Supply into Cyber Career Entry Points
Career Pathways for Network Administration

Network Administrators

Skills:
- Systems Administration
- Windows Server
- Microsoft SharePoint

Certifications:
- Microsoft Certified Systems Engineer (MCSE)
- Cisco Certified Network Associate
- Security+ Certification
- Network+ Certified
- Microsoft Certified Systems Administrator

Network Administration
- Domain Name System
- Firewalls
- PERL
- Solaris
- Apache Webserver

Solaris
- Apache Webserver

Computer Support Specialists

Network/Systems Support Specialists

Computer Programmers

Webmasters/Administrators

Skills:
- System/Network Config.
- Network Administration
- Domain Name System
- Cisco
- Installation and Config.
- TCP/IP
- Firewalls
- PERL
- Technical Support
- Apache Webserver

Network Administration
- Domain Name System
- Cisco
- Installation and Config.
- TCP/IP
- Wide Area Networks
- Technical Support

Certifications:
- Microsoft Certified Systems Engineer (MCSE)
- Cisco Certified Network Associate
- Security+ Certification
- Network+ Certified
- Microsoft Certified Systems Administrator
About Burning Glass Real-Time Data

All jobs data in this report are drawn from Burning Glass’s database of online job postings, which includes over 100M worldwide postings collected since 2007. Each day, Burning Glass visits close to 40,000 online jobs sites to collect postings. Using advanced text analytics, over 70 data fields are extracted from each posting including job title, occupation, employer, industry, required skills and credentials and salary. Postings are then deduplicated and placed in a database for further analysis.

About Burning Glass

Burning Glass’s tools and data are playing a growing role in informing the global conversation on education and the workforce by providing researchers, policy makers, educators, and employers with detailed real-time awareness into skill gaps and labor market demand. Burning Glass’s job seeker applications power several government workforce systems and have been shown to have substantive impact on reemployment outcomes and on labor market literacy.

With headquarters in Boston’s historic North End, Burning Glass is proud to serve a client base that spans six continents, including education institutions, government workforce agencies, academic research centers, global recruitment and staffing agencies, major employers, and leading job boards.

For More Information

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