The State of Cybersecurity Talent

January 2018

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Cybersecurity Market Worth
202.36 Billion USD by 2021

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"More than 200,000 U.S. cybersecurity jobs are unfilled. The cybersecurity workforce shortage is expected to reach

1.5 million unfilled positions by 2019"

Forbes Magazine, Oct 2015

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Cybersecurity Skills Shortage a State of Emergency

A vast majority of organizations acknowledge that it is difficult to recruit and hire cybersecurity talent.

ESG brief, (2/2016)

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Demand to Fill Cybersecurity Jobs is Booming

Percentage Growth in Cities (2007-2003)

-4   204

Postings/10,000 Residents per State

0.00   25.10

More than **209,000 cybersecurity jobs in the U.S. are unfilled**, and postings are up 74 percent over the previous five years.
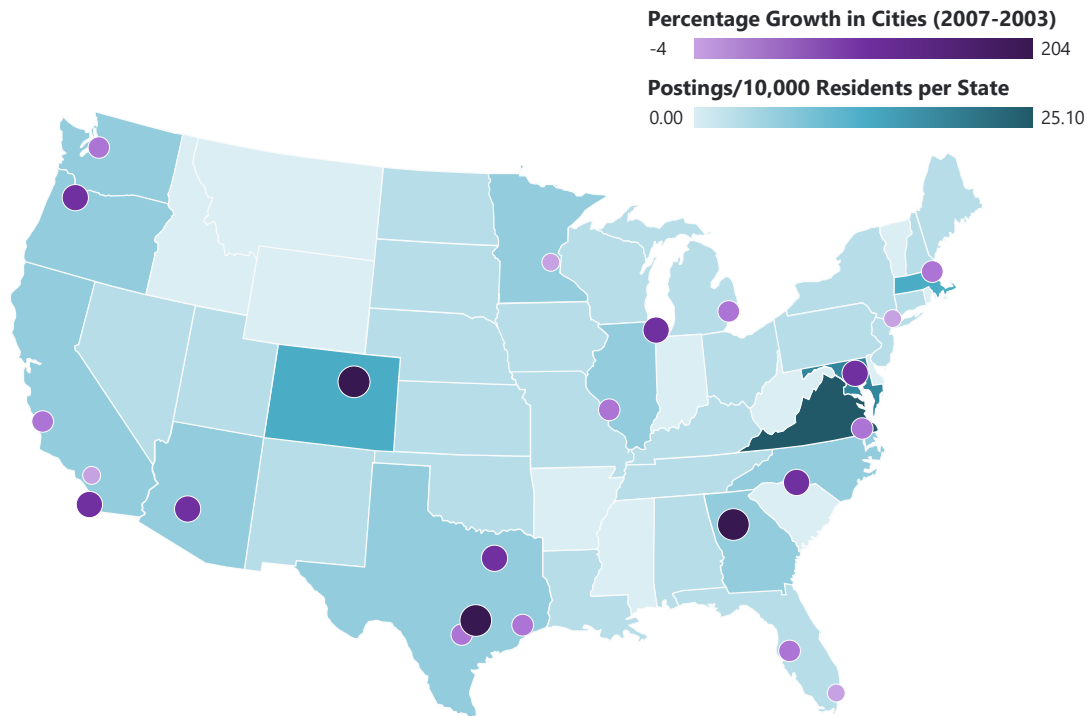
This map shows the top 25 cities by percentage growth of cybersecurity job postings. Between 2007 and 2013.

(Peninsula Press – Standford, 2015)

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Dramatic Skill Shortage in Cybersecurity Professionals

82% of respondents agreed that there is a large shortage in their own organization as well as their country as a whole.
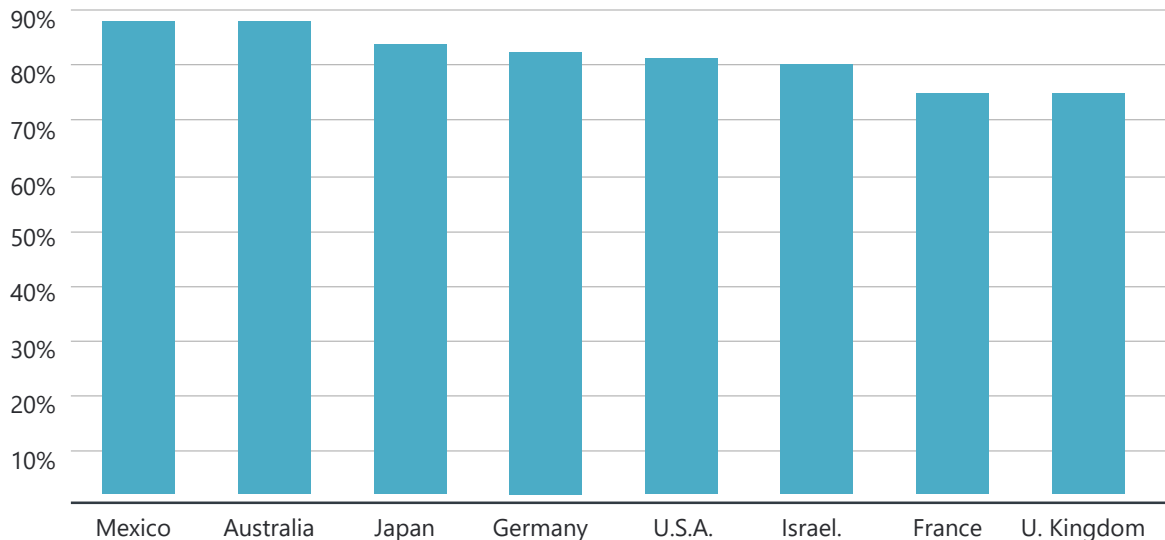
Intel Report
http://www.mcafee.com/us/resources/reports/rp-hacking-skills-shortage.pdf

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A Global Problem Affecting Every Country

Percentage of respondents who say there is a shortage of cybersecurity professionals in their country

	Mexico	Australia	Japan	Germany	U.S.A.	Israel.	France	U. Kingdom

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Demand to Fill Cybersecurity Jobs is Booming

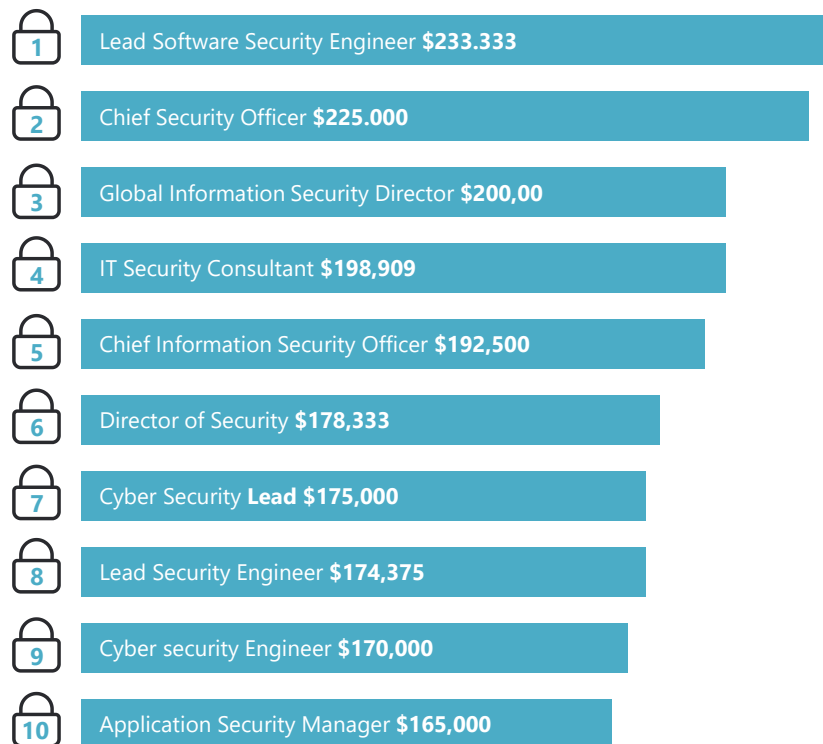Cybersecurity jobs on average offer a premium of about $12,000 over the average for all computer jobs

(Peninsula Press – Standford, 2015)

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Cybersecurity Talent Gap in Spite of High Salaries...

Top 10 Security Skills

Average salaries

1	Lead Software Security Engineer **$233.333**
2	Chief Security Officer **$225.000**
3	Global Information Security Director **$200,00**
4	IT Security Consultant **$198,909**
5	Chief Information Security Officer **$192,500**
6	Director of Security **$178,333**
7	Cyber Security **Lead $175,000**
8	Lead Security Engineer **$174,375**
9	Cyber security Engineer **$170,000**
10	Application Security Manager **$165,000**

Source: Dice Jobs Database,2013-15
http://media.dice.com/wp-content/uploads/2015/05/MayDiceReportImage.jpg

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The Skill Shortage is relevant for every vertical

46% of organizations claim to have a problematic shortage of cyber security skills.

Category	Percentage
Cybersecurity	46%
Mobile application development	37%
Business intelligence/data analytics	36%
Social media/marketing technologies	34%
Enterprise mobility management	31%
Server virtualization/private cloud infrastructure	31%
Compliance management, monitoring and reporting	30%
Social enterprise/collaboration technologies	30%
IT architecture/planning	30%
Application development	28%
Data protection	27%
Database administration	25%
Help desk/service desk	24%
Storage administration	24%
Server administration	22%
Network administration	22%
We do not have any IT skills shortages	12%
Other	1%
Don't Know	2%

ESG brief, (2/2016)
http://www.esg-global.com/hubfs/ESG-Brief-Cybersecurity-Skills-Shortage-Feb-2016.pdf

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The Need for Trained Personnel

*"In advanced security analytics, **the value comes from the people. Software does not provide the answers; it provides the tools** and delivers the data needed to discover answers." — "Big Data" Analytics in Network Security,,*
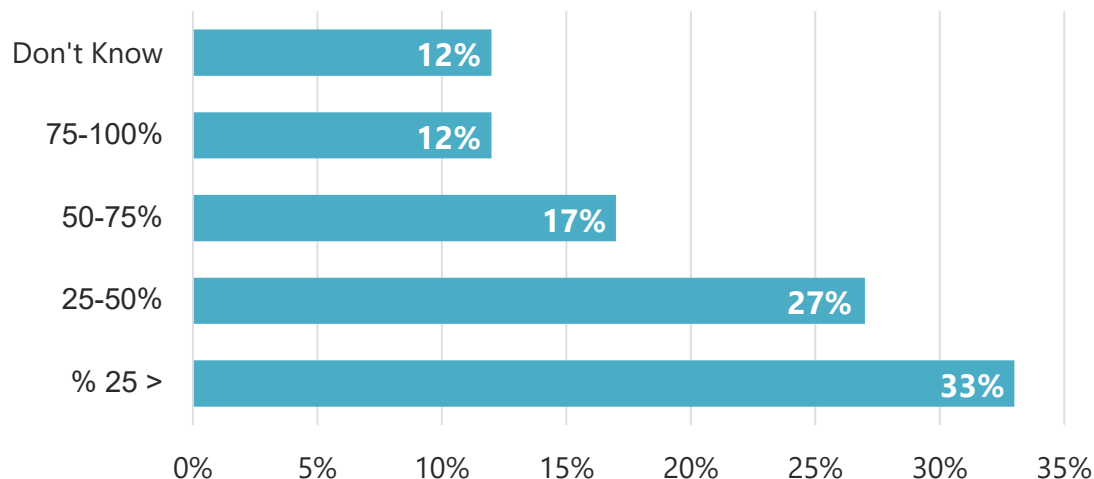
Frost & Sullivan

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Cybersecurity Personnel are Underqualified Upon Hire

60 percent note the lack of qualification of half of the job candidates

On average, how many cybersecurity/information security applicants are qualified upon hire?

Figure 8 – Qualified Applicants

Category	Value
Don't Know	12%
75-100%	12%
50-75%	17%
25-50%	27%
% 25 >	33%

(X-axis: 0%, 5%, 10%, 15%, 20%, 25%, 30%, 35%)

https://www.isaca.org/cyber/Documents/state-of-cybersecurity_res_eng_0316.pdf

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Top Computer Science Programs Aren't Providing The Relevant Skills

Of the top ranked U.S. computer science programs...

0
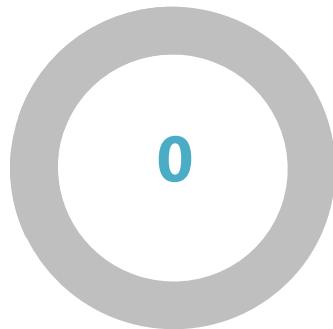
of the top 10 require a cybersecurity course for graduation

3

of the top 50 require a cybersecurity course for graduation

1

of 121 top schools require 3 or more cybersecurity course for graduation

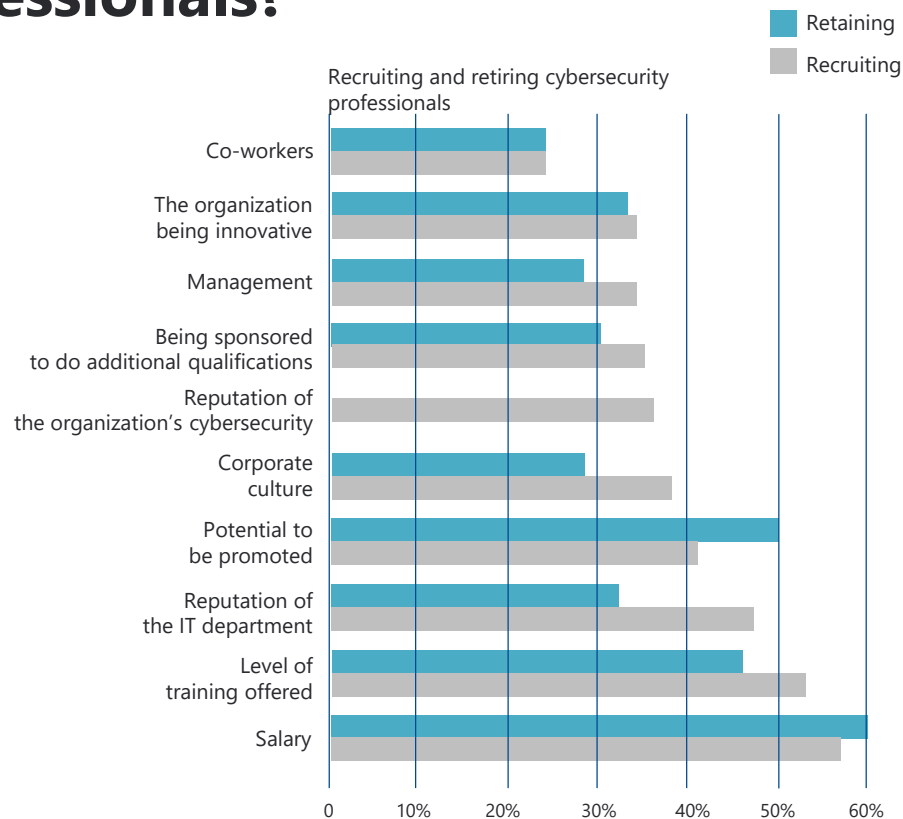Cloudpassage, 2016

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What factors are important when recruiting and retaining cybersecurity professionals?

Level of **training offered is the second most important parameter** when recruiting cybersecurity personnel and the third most important when retaining them

Recruiting and retiring cybersecurity professionals

Legend: Retaining, Recruiting

Categories (top to bottom): Co-workers; The organization being innovative; Management; Being sponsored to do additional qualifications; Reputation of the organization's cybersecurity; Corporate culture; Potential to be promoted; Reputation of the IT department; Level of training offered; Salary

X-axis: 0, 10%, 20%, 30%, 40%, 50%, 60%

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Existing Cybersecurity Training Programs Don't Necessarily Focus on the Right Skill Sets

*"When you've got everybody in the world realizing they need to do something and going to the market, it leads to a skills shortage, especially when **we haven't been training people with these skill sets necessarily**"*
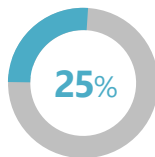
Robert Stroud, international president of ISACA

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Lack of Hands-On Experience

Managers' expectations are shifting when considering candidates for cyber security positions:
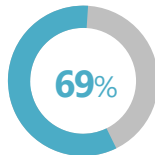
55%
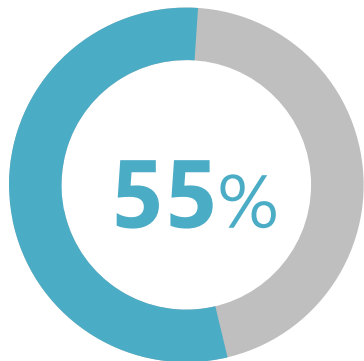
of respondents report that practical, hands-on experience is the most important cyber security qualification

25% of respondents say today's cyber security candidates are lacking in technical skills
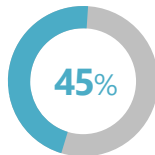
45% of respondents don't believe most applicants understand the business of cyber security

69% of respondents indicate that their organizations typically require a security certification for open positions and most view certifications as equally, if not more, important as formal education

https://www.isaca.org/About-ISACA/Press-room/News-Releases/2017/Pages/Survey-Cyber-Security-Skills-Gap-Leaves-1-in-4-Organizations-Exposed-for-Six-Months-or-Longer.aspx

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What is the biggest barrier to CIOs success?

CIOs see talent (skills and resources) as the No. 1 barrier to their success - **22**% of respondents.

Gartner: 2016 CIO Agenda Survey - 7

	Barrier to success as CIO	Percentage of CIOs
1	Skills/Resources	22%
2	Funding/Budgets	15%
3	Culture/Structure of organization	12
4	IT-business alignment	11%
5	Technology challenges (legacy, security, etc)	9%
6	Capacity/Willingness to change	8%
7	Management sponsorship/understanding/relationships	8%

Note: Percentages represent the number of CIOs identifying an item as their main barrier.
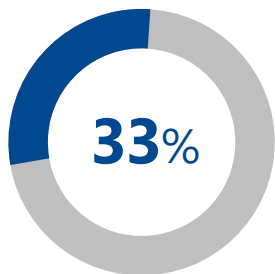
https://www.gartner.com/imagesrv/cio/pdf/cio_agenda_insights_2016.pdf

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Cybersecurity Workforce Shortage Impacts Every Aspect
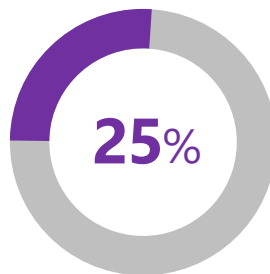
100% of respondents suffer a negative impact of the cybersecurity skill shortage
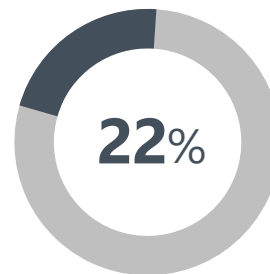
35%
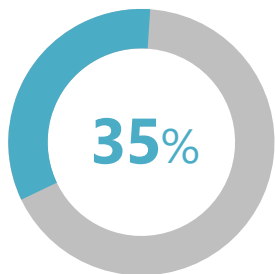
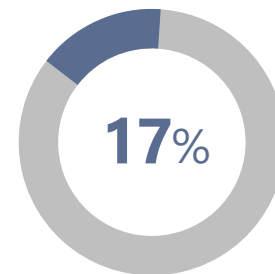We can't maintain an adequate staff of cybersecurity professionals

33%

We are a target for hackers as they know our cybersecurity is not strong enough

25%

We've lost proprietary data through cyberattacks
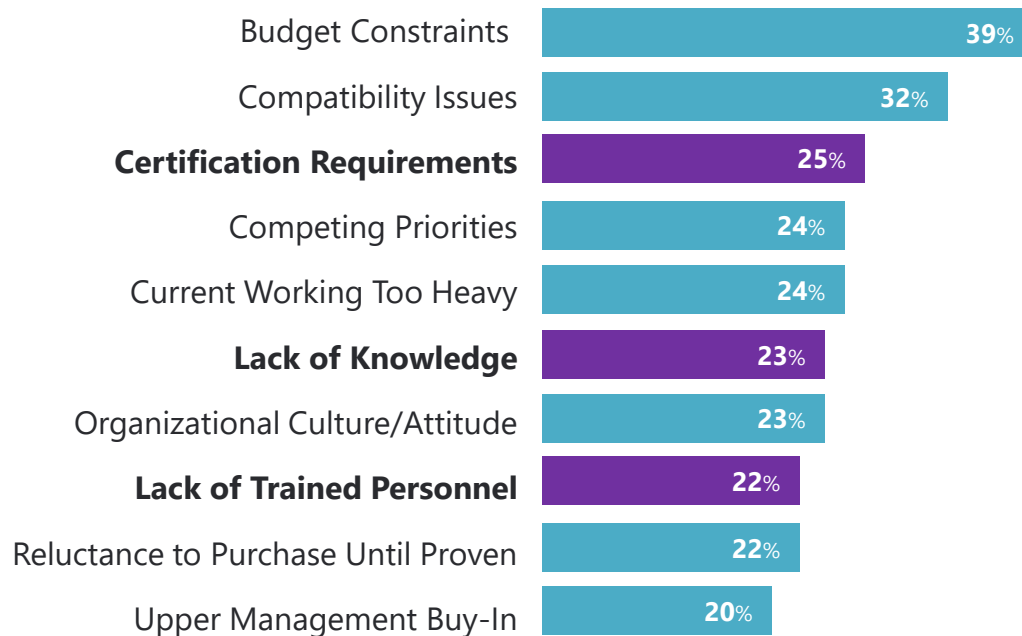
22%

We've suffered reputational damage

17%

We've had a reduced ability to create new IP for products and services

http://www.mcafee.com/us/resources/reports/rp-hacking-skills-shortage.pdf

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Lack of Trained Personnel is also a Barrier for Adopting Advanced Technologies

Biggest Barriers to Adopting Security Processes and Technology

2015 (n=2432)

Barrier	Percentage
Budget Constraints	39%
Compatibility Issues	32%
Certification Requirements	25%
Competing Priorities	24%
Current Working Too Heavy	24%
Lack of Knowledge	23%
Organizational Culture/Attitude	23%
Lack of Trained Personnel	22%
Reluctance to Purchase Until Proven	22%
Upper Management Buy-In	20%

https://emear.thecisconetwork.com/site/content/lang/en/id/5322

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Retaining Staff is a Major Challenge Too

Nearly **50**% of security leaders cite **lack of training** or qualification sponsorship as common reasons for **talent departure**

Hacking the skills shortage CSIS and Intel Security, **July 2017**

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Training is Crucial to Gaining the Upper Hand on Threat Actors

New technology can provide a false sense of security, as operating budgets do not take into account the time to support, maintain and operate the new technology—thus it becomes ineffective. Threat actors have the upper hand when technology is not maintained and they develop ways to circumvent how it works.

Continuous operational and security training, coupled with additional staff, are required to stay on the same level as threat actors.

Verizon data breach 2016

http://www.verizonenterprise.com/verizon-insights-lab/dbir/2016/

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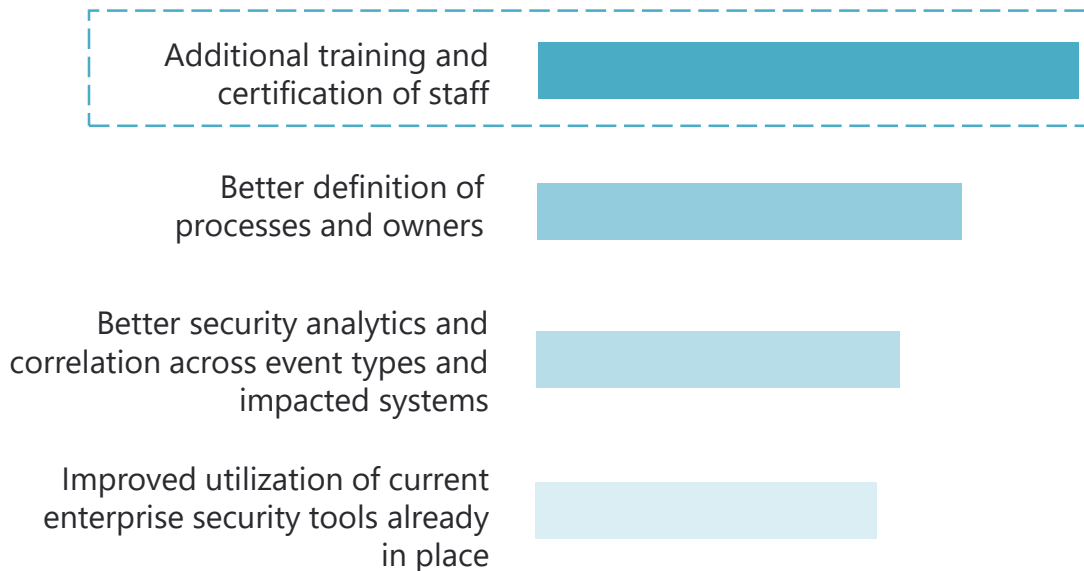# Closing the Cybersecurity Gap Requires Education

Closing the gap in cybersecurity skills requires countries to develop critical technical skills, cultivate a larger and more diverse workforce, and
reform education programs to include more hands-on learning

Intel Report
http://www.mcafee.com/us/resources/reports/rp-hacking-skills-shortage.pdf

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This is WHY Security Leaders' #1 Investment Priority for 2017 is TRAINING

What improvements in IR is your organization planning to make in the next 12 months?

Additional training and certification of staff

Better definition of processes and owners

Better security analytics and correlation across event types and impacted systems

Improved utilization of current enterprise security tools already in place
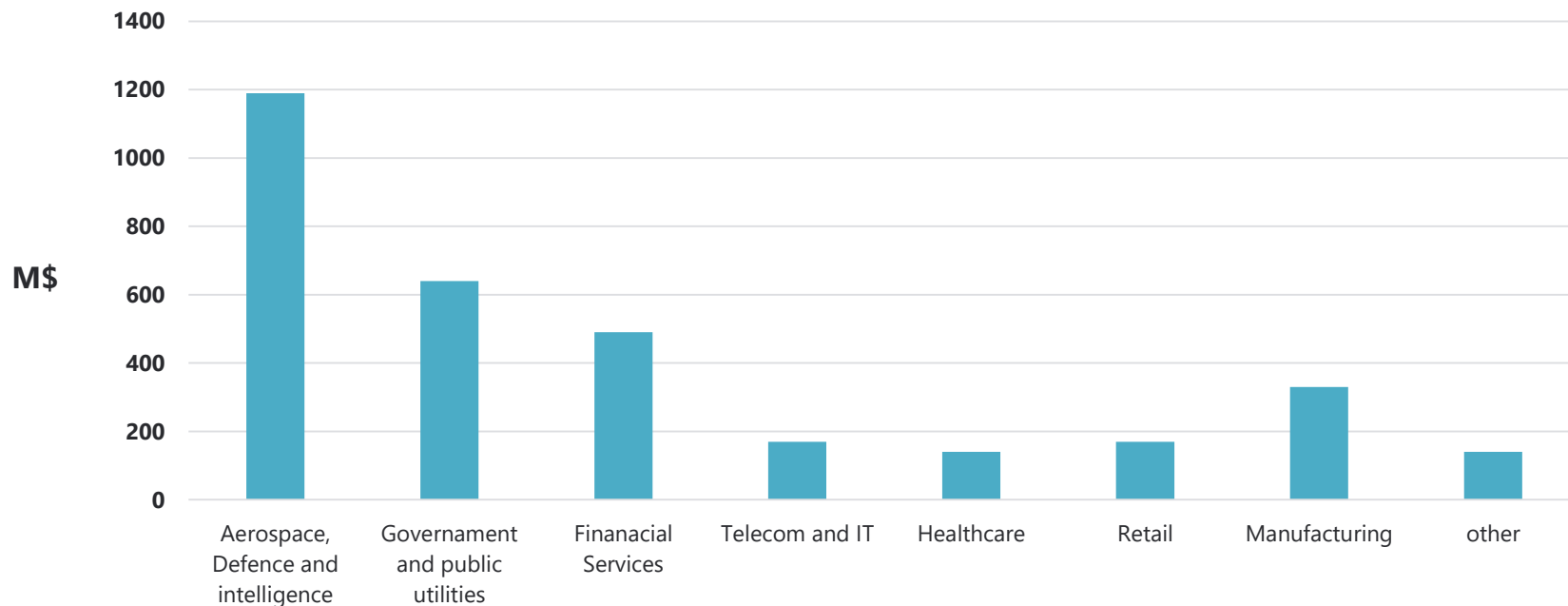
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This Market will Continue to Grow Exponentially

Education and Training Market Size, by Region, 2014-2019 ($Billion)

Region	2014	2015	2016	2017	2018	2019	CAGR (2014-20160
NA	1.13	1.19	1.27	1.35	1.44	1.55	6.4%
EU	0.69	0.71	0.75	0.78	0.83	0.89	5.2%
APAC	0.47	0.52	0.57	0.64	0.72	0.82	12%
MEA	0.19	0.21	0.24	0.26	0.30	0.34	11.6%
LA	0.15	0.17	0.19	0.22	0.25	0.30	15.4%
Total	2.63	2.80	3.01	3.25	3.55	3.90	8.2%

Source: MarketsandMarkets Analysis

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Education and Training Budget Per Vertical in 2017

Source: MarketsandMarkets Analysis

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Thank You!

For more information on how to use advanced simulation technologies to approach the training market, visit the Cyberbit website.

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