



# Career in Cybersecurity

### Why to Start a Career in Cybersecurity?

- High Demand**
  - According to the Bureau of Labor Statistics, the demand for cybersecurity professionals is projected to grow by 33% from 2019 to 2029.
  - As more organizations adopt BYOD policies, they are facing a host of challenges including how to secure information stored on a range of devices that they don't own.
- High Pay**
  - According to the Bureau of Labor Statistics, the median annual wage for information security analysts is \$99,730 as of May 2020.
- Learning Path**
  - There are many ways to learn cybersecurity, including through formal education, self-paced online courses, and hands-on experience.
- High Flexibility**
  - Cybersecurity professionals can work in a variety of settings, including government, private industry, and academia.

### Skills To Land a Cybersecurity Job

- Get certified** - Ranging from ISCC Certified Information Systems Security Professional (CISSP) to vendor-specific certifications from Cisco, RSA, Symantec and others
- Learn SAML (Security Assertion Markup Language)** - exchanging authentication and authorization data between parties
- Master mobile security** - As more organizations adopt BYOD policies, they are facing a host of challenges including how to secure information stored on a range of devices that they don't own.
- Learn to analyze data**

### Types of Cybersecurity Jobs

Below are just several cybersecurity jobs in public and private industry:

- Chief Information Security Officer (CISO)
- Computer Crime Investigator
- Computer Security Incident Responder
- Cryptanalyst
- Cyberanalyst
- Database Security Analyst
- Endpoint Protection Analyst
- Information Security Analyst
- Information Systems Forensics
- Network Security Engineer
- Security Analyst
- Security Engineer
- Security Operations Center Analyst
- Security Systems Administrator
- Security Software Developer
- System Administrator
- System Security Analyst
- System Security Officer
- System Security Specialist
- System Security Tester

### The Cybersecurity Work Environment

- Cybersecurity jobs can be pretty stressful at times
- Cybersecurity professionals must have the capability to support large situations like threat of Service or Virus attacks
- They must have the knowledge and skill to rapidly respond to threats as soon as they are detected
- The cybersecurity workforce must be able to maintain high performance during steady state, as well as effectively support during a workload surge.

Year	Employment	Change	Percentage
2019	280,000	+10%	3.5%
2020	300,000	+7%	2.5%
2021	320,000	+7%	2.3%
2022	340,000	+6%	1.9%
2023	360,000	+6%	1.8%
2024	380,000	+6%	1.7%
2025	400,000	+5%	1.6%
2026	420,000	+5%	1.5%
2027	440,000	+5%	1.4%
2028	460,000	+5%	1.3%
2029	480,000	+5%	1.3%

### Questions and Answers

- Why is the demand for Cybersecurity Jobs the highest than any other IT field?

Because more companies would want to protect their sensitive information and data, and want to substitute any of their cybersecurity work to an individual job.
- What's the most important step to land a job in the cybersecurity field?

Getting certified. Ranging from ISCC Certified Information Systems Security Professional (CISSP) to vendor-specific certifications from Cisco, RSA, Symantec and others.
- What are the 5 steps need to be researched when a threat is detected?

Identify, Protect, Detect, Respond and Recover

### Thank You!

References:

- <https://www.bls.gov/news.release/archives/ITW040420.htm>
- <https://www.bls.gov/news.release/archives/ITW040420.htm>
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### Intro. Career in Cybersecurity

- 89% of cybersecurity experts recommend a college degree for other IT jobs.
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### Intro To Cybersecurity

- Introduction to the field of cybersecurity, covering basic concepts and career paths.

### Career In Cybersecurity

CSE 3482  
Professor: Natalija Vljajic  
Tenzin Nyima  
Garv Kapur  
Asif Turkey





# Career in Cybersecurity

### Why to Start a Career in Cybersecurity?

- High Demand**
  - According to the Bureau of Labor Statistics, the demand for information security analysts is projected to grow 31% from 2014 to 2022.
  - Information security analysts are responsible for protecting an organization's information systems and networks from digital attacks.
  - They are also responsible for identifying vulnerabilities and implementing security measures to protect the organization's data.
- High Pay**
  - Information security analysts earn a median annual salary of \$98,090, which is significantly higher than the national average for all occupations.
- Learning Skills**
  - Information security analysts must have a strong understanding of computer systems and networks.
  - They must also be able to identify vulnerabilities and implement security measures to protect the organization's data.
- High Flexibility**
  - Information security analysts can work in a variety of settings, including government agencies, financial institutions, and private industry.

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Year	Employment	Change	Percentage
2014	1,100,000	100%	100%
2015	1,200,000	9%	109%
2016	1,300,000	8%	118%
2017	1,400,000	8%	127%
2018	1,500,000	7%	136%
2019	1,600,000	7%	145%
2020	1,700,000	6%	154%
2021	1,800,000	6%	163%
2022	1,900,000	6%	172%

### Questions and Answers

- Why is the demand for Cybersecurity jobs the highest that any other IT field?

Because most companies would want to protect their sensitive information and data, and want to substitute any of their cybersecurity work to an individual job.
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- [http://www.bls.gov/news.release/archives/2015\\_12/20151204.pdf](http://www.bls.gov/news.release/archives/2015_12/20151204.pdf)
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- [http://www.bls.gov/news.release/archives/2018\\_12/20181204.pdf](http://www.bls.gov/news.release/archives/2018_12/20181204.pdf)
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- [http://www.bls.gov/news.release/archives/2021\\_12/20211204.pdf](http://www.bls.gov/news.release/archives/2021_12/20211204.pdf)
- [http://www.bls.gov/news.release/archives/2022\\_12/20221204.pdf](http://www.bls.gov/news.release/archives/2022_12/20221204.pdf)

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# Intro To Cybersecurity



- Cybersecurity is the process of applying security measures to ensure confidentiality, integrity, and availability of data.
- Cybersecurity assures protection of assets, which includes data, desktops, servers, buildings, and most importantly, humans.

- The goal of cybersecurity is to protect data both in transit and at rest. Countermeasures can be put in place in order to ensure security of data.
- Some of these measures include - access control, awareness training, audit and accountability, risk assessment, penetration testing, vulnerability management, and security assessment and authorization.

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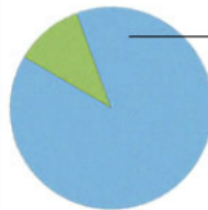
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# Intro. Career in Cybersecurity

- CIO magazine - Cybersecurity experts most sought-after;
- Demand for Cybersecurity experts grown 3.5 times faster than the demand for other IT jobs;
- ESG showed that 42% of the organizations intend to increase headcount in information security;
- The average income is three times higher than the US national median income for full time workers



## High job security in Cybersecurity



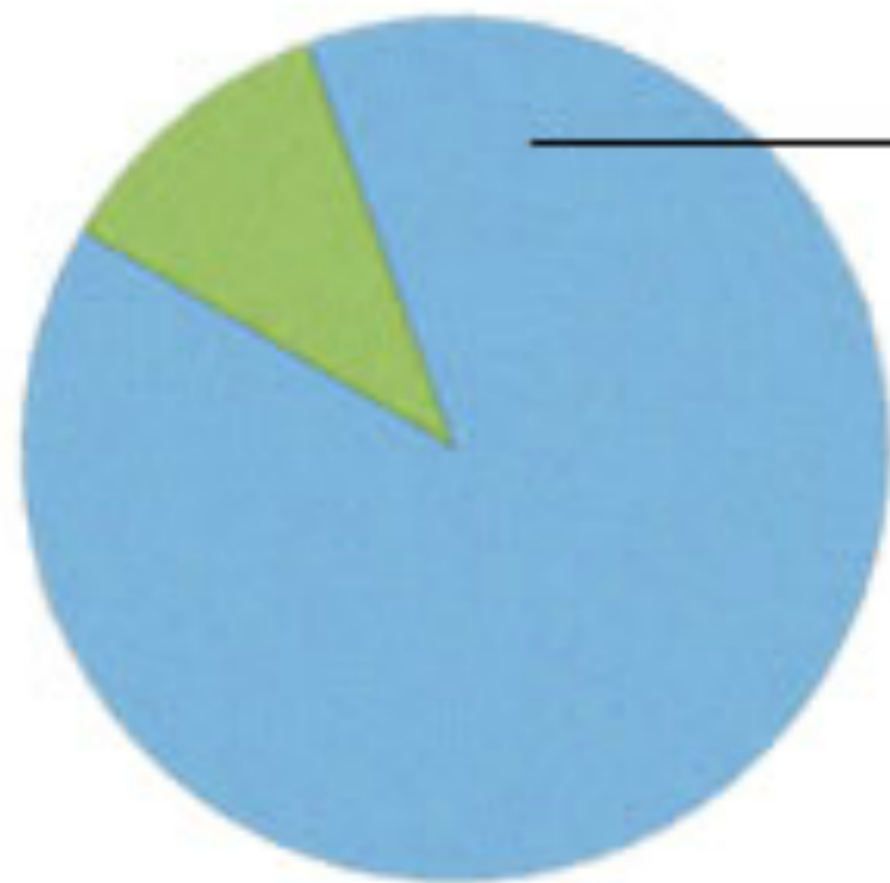
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of IT security staffers say they feel at least somewhat secure in their jobs

From Nextgov.com



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Upper Class courses requirement at York U

LE/CSE 3213 3.00;  
LE/CSE 3214 3.00;  
LE/CSE 3481 3.00;  
LE/CSE 3482 3.00;  
LE/CSE 4413 3.00;  
LE/CSE 4480 3.00;  
LE/CSE 4481 4.00;  
LE/CSE 4482 3.00;

<http://www.cyberaces.org/>

Certified Secure Software Lifecycle Professional (CSSLP)  
GIAC Secure Software Programmer - .NET California  
Certified Information Security Manager (CISM)  
GIAC Certified Intrusion Analyst  
Certified Expert Penetration Tester (CEPT)  
GIAC Certified Windows Security Administrator (GCWN)  
CheckPoint Certified Security Expert  
CyberSecurity Forensic Analyst  
Cisco Certified Network Professional Security (CCNP Security)  
Other - Please specify:  
GIAC Secure Software Programmer - Java (GSSP-JAVA) Utah  
Certified Information Systems Security Professional (CISSP)  
Certified Ethical Hacker (CEH)  
Certified Penetration Tester (CPT)  
Certified Wireless Security Professional (CWSP)  
CheckPoint Certified Security Administrator  
Certified Hacking Forensic Investigator (CHFI)  
Cisco Certified Network Associate Security (CCNA Security)  
Cisco Certified Internetwork Expert Security (CCIE Security)

# Why to Start a Career in Cybersecurity?

## High Demand

- According to Bloomberg Businessweek, the U.S. Department of Defense and the FBI alone would like to recruit 6,000 people with cybersecurity skills by the end of 2016.
- Technology alone is not enough to prevent, detect, respond to and recover from cybersecurity incidents; there is also a critical need for skilled people.
- According to a source, the unemployment rate for cybersecurity professionals is currently near or below zero.

## High Pay

- Average salary for U.S. security professionals to be \$118,000, or approximately \$55 per hour. That's nearly three times the national median income for full-time wage and salary workers



## Learning Skills

- Cybersecurity is interesting, challenging, technology-focused work where one gets to learn really unique, interesting and challenging skills
- Harvard Business Review referred to data scientists — that is, the people who can coax valuable insights out of a messy, complex collection of data — as “The Sexiest Job of the 21st Century.”

## Highly Dynamic

Cybersecurity is a constant state of change. There are no complacent jobs.

The fascinating battle between the digital world and the real world is the heart of the matter. It's a never-ending struggle for the good guys to stay one step ahead of the bad guys.

## Highly Transferable

- Highly portable;
- U.S. Bureau of Labor Statistics confirms that these jobs are located virtually at every parts of the world;
- All you need is a network connection, and you can be on the job (though there's both an upside and a downside to that).

## Higher Purpose

- Cybersecurity professionals not famous;
- Not just cool, provides committed, faithful and honorable service to their organizations, countries and society as a whole;
- Cybersecurity professionals will increasingly be recognized and appreciated as an important and meaningful vocation like Police men and Fire fighters.
- Disclaimer: You may turn into a bad guy. Story...

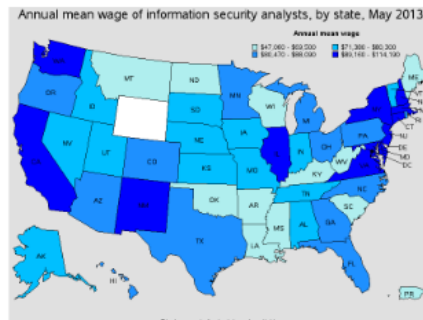
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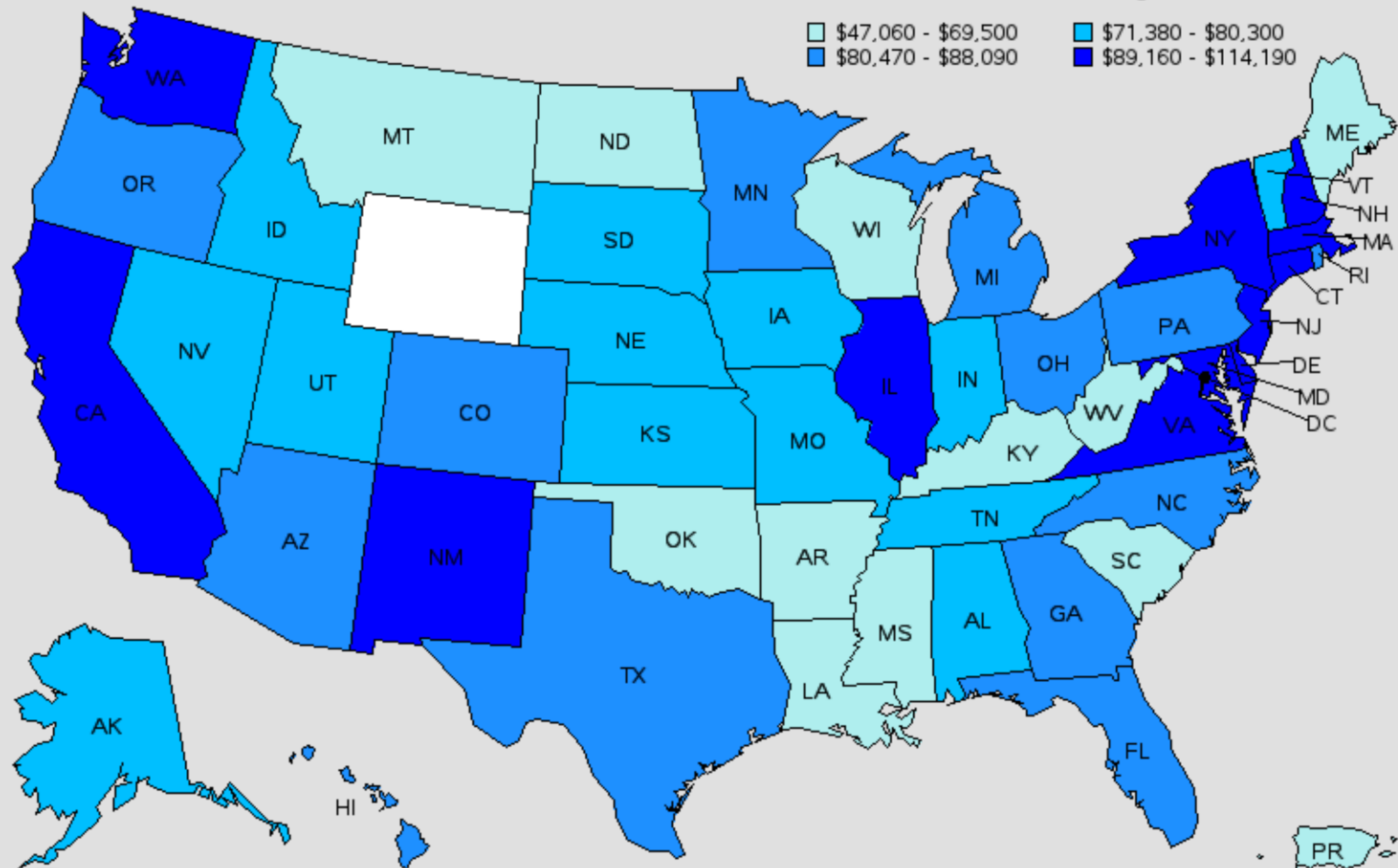
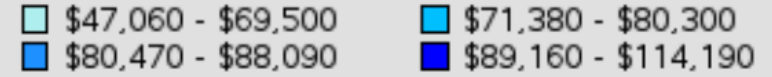
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Job Title	2013 Salary	2014 Salary	2015 Salary	2 Year Change
Information Security Analyst	\$95,900 - \$129,700	\$100,900 - \$137,200	\$106,200 - \$149,000	+ 12%
Systems Security Administrator	\$89,900 - \$123,700	\$95,200 - \$131,900	\$100,000 - \$140,200	+ 11.2%
Network Security Engineer	\$93,900 - \$123,200	\$98,700 - \$131,200	\$105,000 - \$141,200	+ 12.1%
Info. Systems Security Manager	\$108,000 - \$149,700	\$115,200 - \$160,000	\$122,200 - \$171,200	+ 12.2%
Chief Security Officer (CSO)	\$119,700 - \$179,200	\$128,700 - \$189,700	\$134,200 - \$204,700	+ 11.8%

# Annual mean wage of information security analysts, by state, May 2013

## Annual mean wage



Job Title	2013 Salary	2014 Salary	2015 Salary	2-Year Change
Information Security Analyst	\$95,000 - \$129,750	\$100,500 - \$137,250	\$106,250 - \$149,000	+ 12%
Systems Security Administrator	\$89,500 - \$123,750	\$95,250 - \$131,500	\$100,000 - \$140,250	+ 11.2%
Network Security Engineer	\$93,500 - \$123,250	\$99,750 - \$131,250	\$105,000 - \$141,500	+ 12.1%
Info. Systems Security Manager	\$108,000 - \$149,750	\$115,250 - \$160,000	\$122,250 - \$171,250	+ 12.2%
Chief Security Officer (CSO)	\$119,750 - \$179,250	\$126,750 - \$189,750	\$134,250 - \$204,750	+ 11.8%

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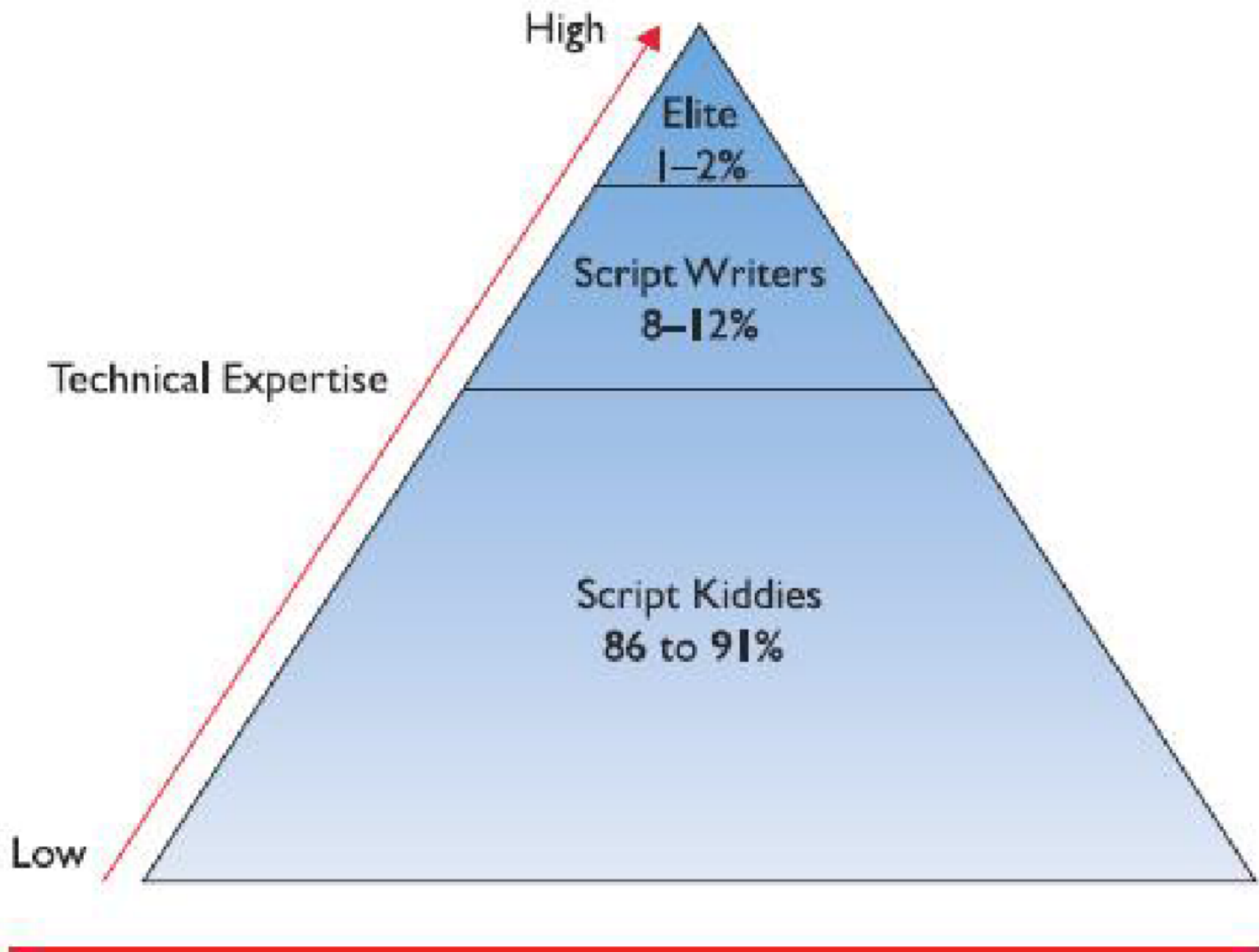
- **Cybersecurity is in a constant state of change — thank you, Moore's Law**
- **The fascinating battle between the technology makers and the technology breakers goes back hundreds of years, but the faster technology changes, the faster attackers can exploit it.**

## *Highly Transferable*

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• Figure 1.1 Distribution of attacker skill levels



- Christopher Weatherhead, 22, Northampton University, UK.
- (DDoS) attacks on PayPal, Visa and Mastercard in December 2010.
- Sustained PayPal with 3.5 Million Pounds (~5.25 M USD) damage.
- He is currently out on bail (amount not mentioned).
- The hacker is banned from using internet chat relays or posting online under the pseudonym “Nerdo” or any other name but his own.
- Judge ordered him to be electronically tagged and subject to a midnight to 4 am curfew at his parents' home.

## ***Skills To Land a Cybersecurity Job***

- **Get certified - Ranging from ISC2 Certified Information Systems Security Professional (CISSP) to vendor-specific certifications from Cisco, RSA, Symantec and others**
- **Learn SAML (Security Assertion Markup Language) - exchanging authentication and authorization data between parties**
- **Master mobile security - As more organizations adopt BYOD policies, they are facing a host of challenges including how to secure information stored on a range of devices that they don't own.**
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## ***Types of Cybersecurity Jobs***

**Below we've listed several cybersecurity jobs in public and private industry:**

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- Computer Crime Investigator
- Computer Security Incident Responder
- Cryptanalyst
- Cryptographer
- Disaster Recovery Analyst
- Forensics Expert
- Incident Responder
- Information Assurance Analyst
- Intrusion Detection Specialist
- Network Security Engineer
- Security Architect
- Security Analyst
- Security Consultant
- Security Engineer
- Security Operations Center Analyst
- Security Systems Administrator
- Security Software Developer
- Source Code Auditor
- Virus Technician
- Vulnerability Assessor
- Web Penetration Tester

# The Cybersecurity Work Environment

- Cybersecurity jobs can be pretty stressful at times
- Cybersecurity professionals must have the capability to support surge situations like Denial of Service or virus attacks.
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## IDENTIFY

- Asset management
- Business environment
- Governance
- Risk assessment
- Risk management strategy

## PROTECT

- Access control
- Awareness and training
- Data security
- Information protection and procedures
- Maintenance
- Protective technology

## DETECT

- Anomalies and events
- Security continuous monitoring
- Detection process

## RESPOND

- Response planning
- Communications
- Analysis
- Mitigation
- Improvements

## RECOVER

- Recovery planning
- Improvements
- Communications



# Thank You!

## *References:*

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