



# Welcome to Layer Zero!

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**September 16, 2021, Thursday**

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# The Demand For Cybersecurity



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- WORLD ECONOMIES (By Size)**
- 1 US
  - 2 CHINA
  - 3 **CYBERCRIME**
  - 4 JAPAN
  - 5 GERMANY
  - 6 INDIA
- THE RISING COST OF CYBERCRIME**
- | Year | Cost (\$ Trillion) |
|------|--------------------|
| 2015 | \$5                |
| 2021 | \$6                |
| 2025 | \$10.5             |
- DRIVEN BY: INTRUSION
- CYBERCRIME**  
MORE PROFITABLE THAN **DRUG TRADE**
- CYBERCRIME COSTS MORE PER YEAR THAN ALL NATURAL DISASTERS**
- RESEARCH BY **CYBERSECURITY VENTURES**
- cybersecurityventures.com

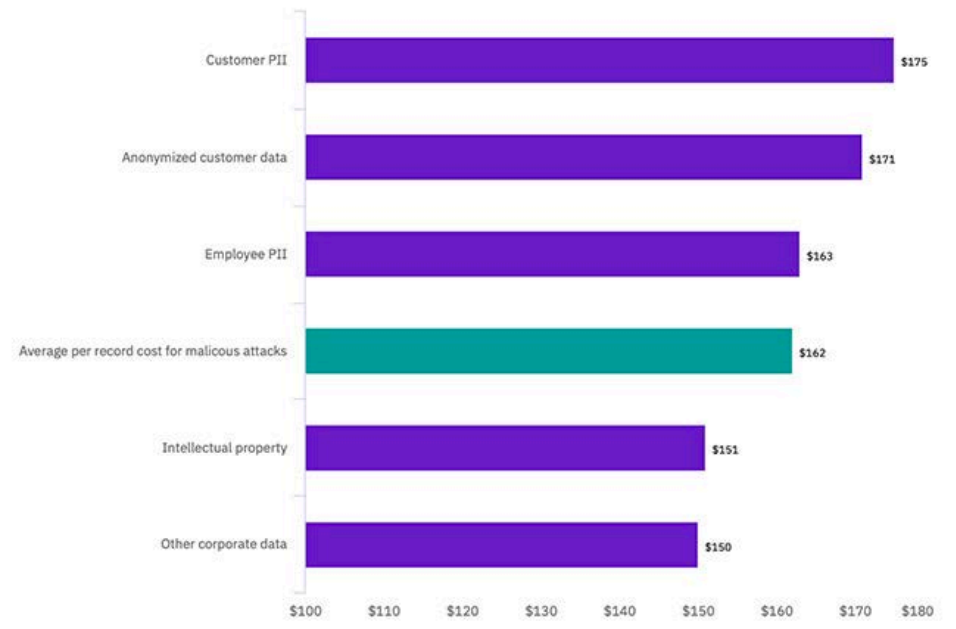
- # The World Economy
- ## Gross Domestic Product (GDP) by Country 2019
- World's Region
- AFRICA
  - AUSTRALIA
  - REST OF THE WORLD
  - LATIN AMERICA AND CARRIBEAN
  - MIDDLE EAST
  - EUROPE
  - ASIA
  - NORTH AMERICA
- 
- | Country/Region    | GDP (\$T) | Percentage (%) |
|-------------------|-----------|----------------|
| United States     | \$21.43T  | 24.42%         |
| China             | \$14.34T  | 16.34%         |
| India             | \$2.88T   | 3.28%          |
| Japan             | \$5.08T   | 5.79%          |
| Germany           | \$3.85T   | 4.38%          |
| United Kingdom    | \$2.83T   | 3.22%          |
| France            | \$2.72T   | 3.09%          |
| Italy             | \$2T      | 2.28%          |
| Russia            | \$1.7T    | 1.94%          |
| Canada            | \$1.74T   | 1.98%          |
| Australia         | \$1.59T   | 1.89%          |
| South Korea       | \$1.64T   | 1.87%          |
| Thailand          | \$0.54T   | 0.62%          |
| Philippines       | \$0.38T   | 0.43%          |
| Singapore         | \$0.37T   | 0.42%          |
| Hong Kong         | \$0.37T   | 0.42%          |
| Malaysia          | \$0.36T   | 0.42%          |
| Bangladesh        | \$0.3T    | 0.34%          |
| Pakistan          | \$0.28T   | 0.32%          |
| Indonesia         | \$1.12T   | 1.28%          |
| Brazil            | \$1.84T   | 2.1%           |
| Mexico            | \$1.26T   | 1.43%          |
| Colombia          | \$0.32T   | 0.37%          |
| Argentina         | \$0.45T   | 0.51%          |
| Chile             | \$0.28T   | 0.32%          |
| Israel            | \$0.4T    | 0.45%          |
| Saudi Arabia      | \$0.79T   | 0.9%           |
| UAE               | \$0.42T   | 0.48%          |
| Qatar             | \$0.42T   | 0.48%          |
| Uzbekistan        | \$0.18T   | 0.2%           |
| Belgium           | \$0.53T   | 0.6%           |
| Spain             | \$1.39T   | 1.59%          |
| Netherlands       | \$0.9T    | 1.04%          |
| Switzerland       | \$0.7T    | 0.8%           |
| Poland            | \$0.62T   | 0.71%          |
| Turkey            | \$0.75T   | 0.86%          |
| Ireland           | \$0.39T   | 0.44%          |
| Norway            | \$0.4T    | 0.46%          |
| Austria           | \$0.45T   | 0.51%          |
| Denmark           | \$0.35T   | 0.4%           |
| Nigeria           | \$0.45T   | 0.51%          |
| South Africa      | \$0.35T   | 0.4%           |
| Egypt             | \$0.3T    | 0.35%          |
| Rest of the World |           | 9.8%           |
- Article & Sources:
- <https://howmuch.net/articles/the-world-economy-2019>
  - <https://databank.worldbank.org>
- howmuch.net

# Cost of data Breach



Average cost per record by type of data compromised in a malicious attack

Measured in US\$

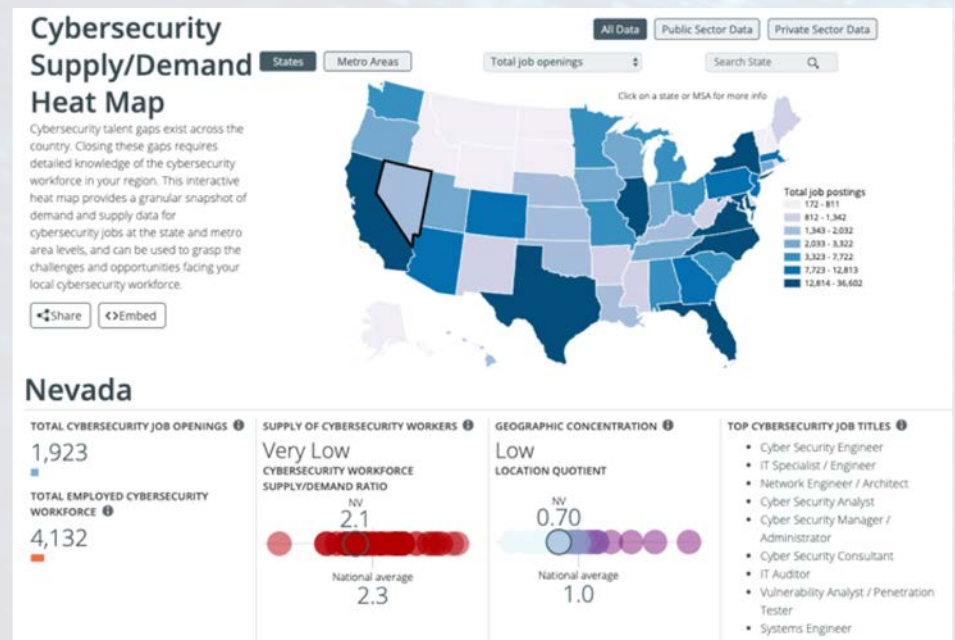
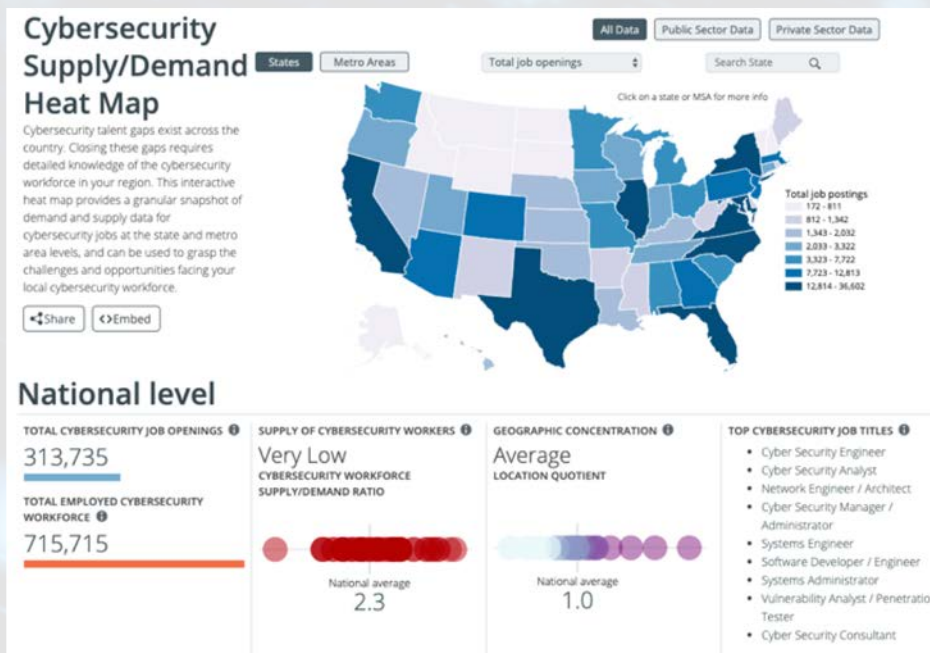




# Cybersecurity Jobs in Fall 2019

## ❑ Cyberseek

- <http://cyberseek.org/heatmap.html>
- 313,735 opening in the nation
- 1,923 openings in Nevada

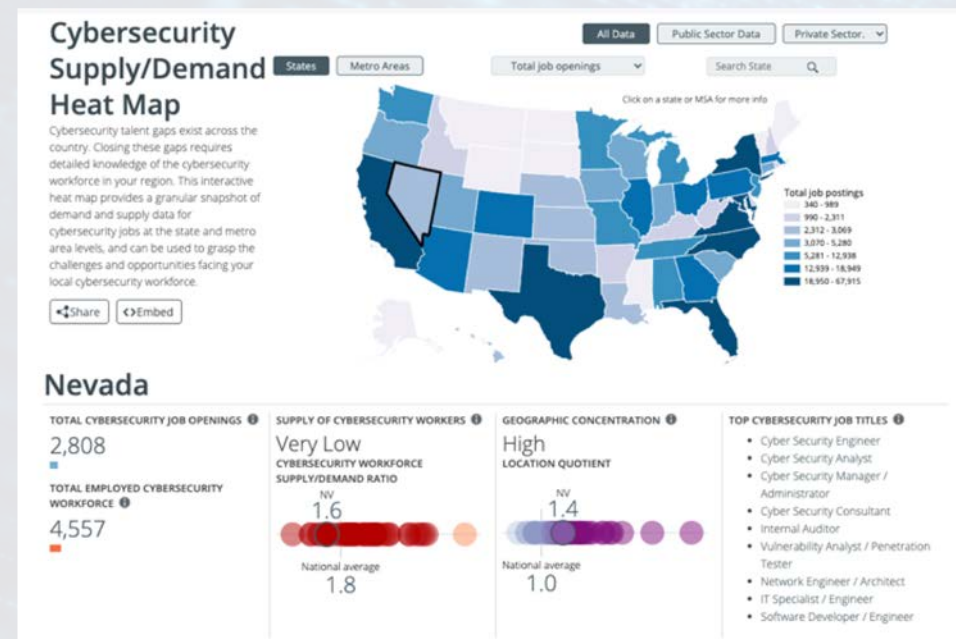


# Cybersecurity Jobs in Fall 2020

## ❑ Cyberseek

- <http://cyberseek.org/heatmap.html>
- **507,924** opening in the nation
- **2,808** openings in Nevada

Can you see the growing demand from last year?



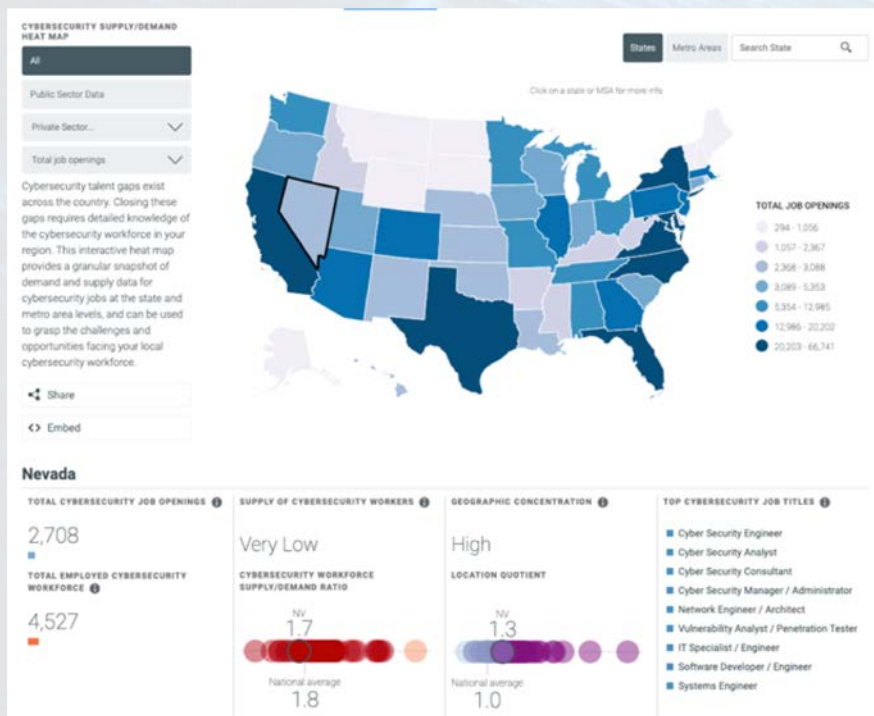
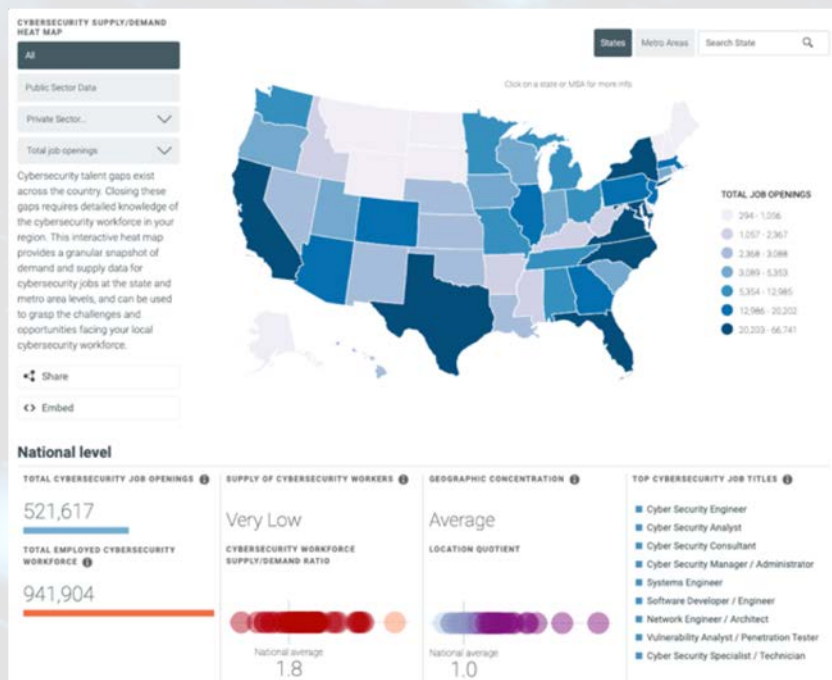


# Cybersecurity Jobs in Jan 2021

## ❑ Cyberseek

- <http://cyberseek.org/heatmap.html>
- 521,617 opening in the nation
- 2,708 openings in Nevada

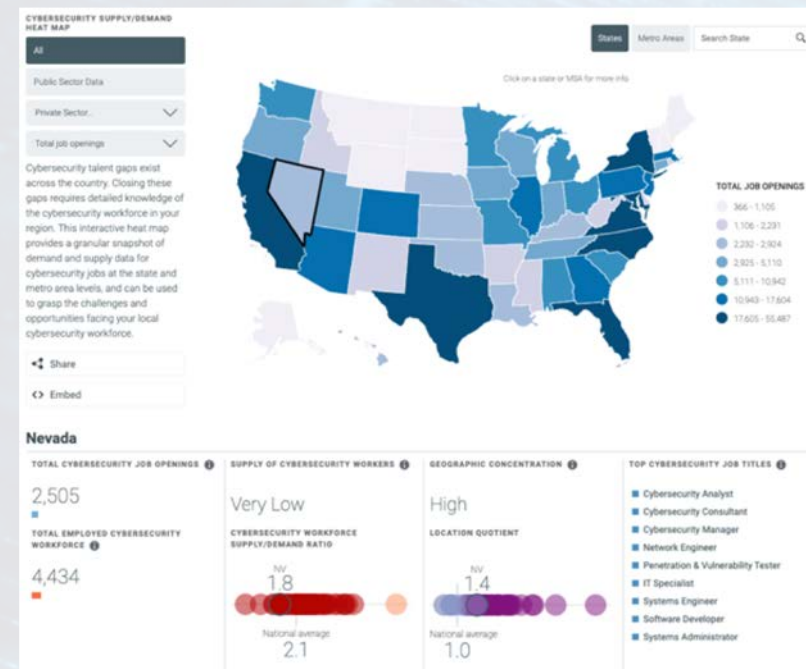
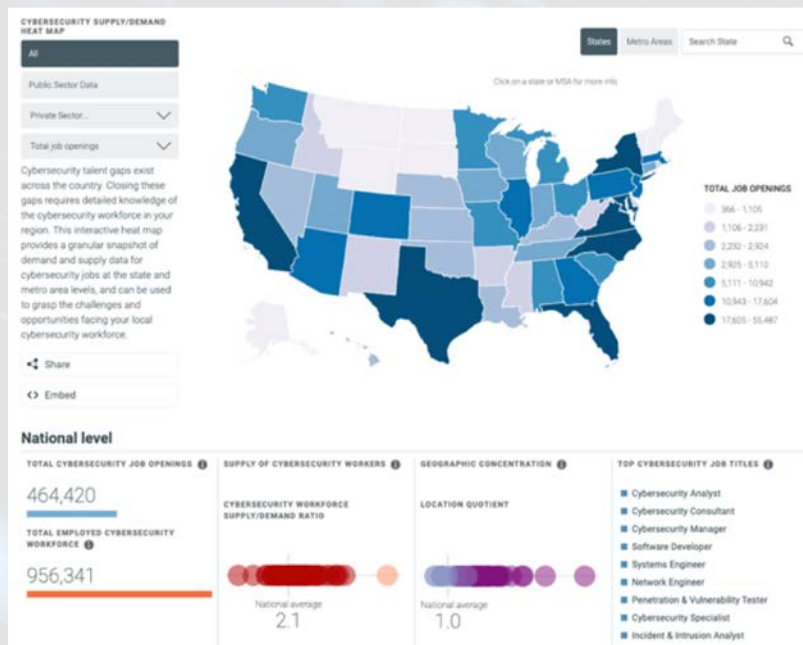
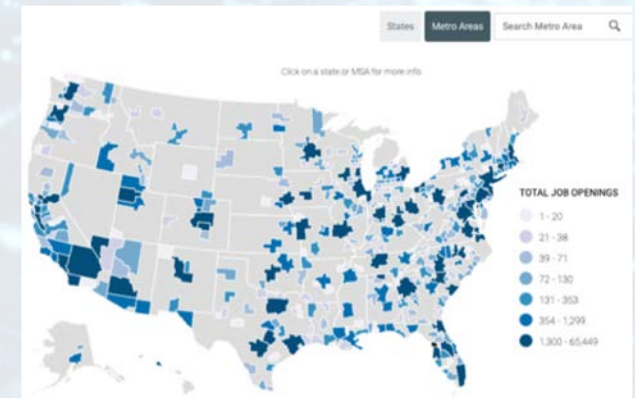
Can you see the growing demand from last Fall?



# Cybersecurity Jobs in Aug 2021

## ❑ Cyberseek

- <http://cyberseek.org/heatmap.html>
- **464,420** opening in the nation
- **2,505** openings in Nevada (1,715 in LV)





**MARKETS**
[see all](#)

▼ DOW	35,229.61	-178.24	-0.50%
▼ S&P 500	4,472.95	-23.10	-0.51%
▼ NASDAQ	14,958.41	-83.83	-0.56%

**FEATURED**

**Cryptocurrency, explained**

If you're a crypto novice, you might be wondering what all the fuss is about

**LATEST**

Reddit turns down moderators who want action on Covid misinformation

Blue Origin successfully completes first test flight with no passengers after Jeff Bezos trip

Wendy's is upgrading its french fries

# Wanted: Millions of cybersecurity pros. Salary: Whatever you want



By [Clare Duffy](#), CNN Business

Updated 3:48 PM ET, Fri May 28, 2021


**THE DRIVERS**
**MICROSOFT: RUSSIAN HACKERS BREAK INTO "USAID" SYSTEM**
**LIVE**
**CNN**

FTSE ▲ 26.27

**FIRST MOVE**
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Fewer people are going to Home Depot. That could be a bad sign for...

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**NOW PLAYING**

Microsoft says SolarWinds hackers have struck again



SolarWinds CEO: Cyber threats need community vigilance



Here's everything you need to know about ransomware



Microsoft urges Windows users to install update



Kasra: con 1,50


**lendingtree**

Mortgage Personal Finance Credit Cards

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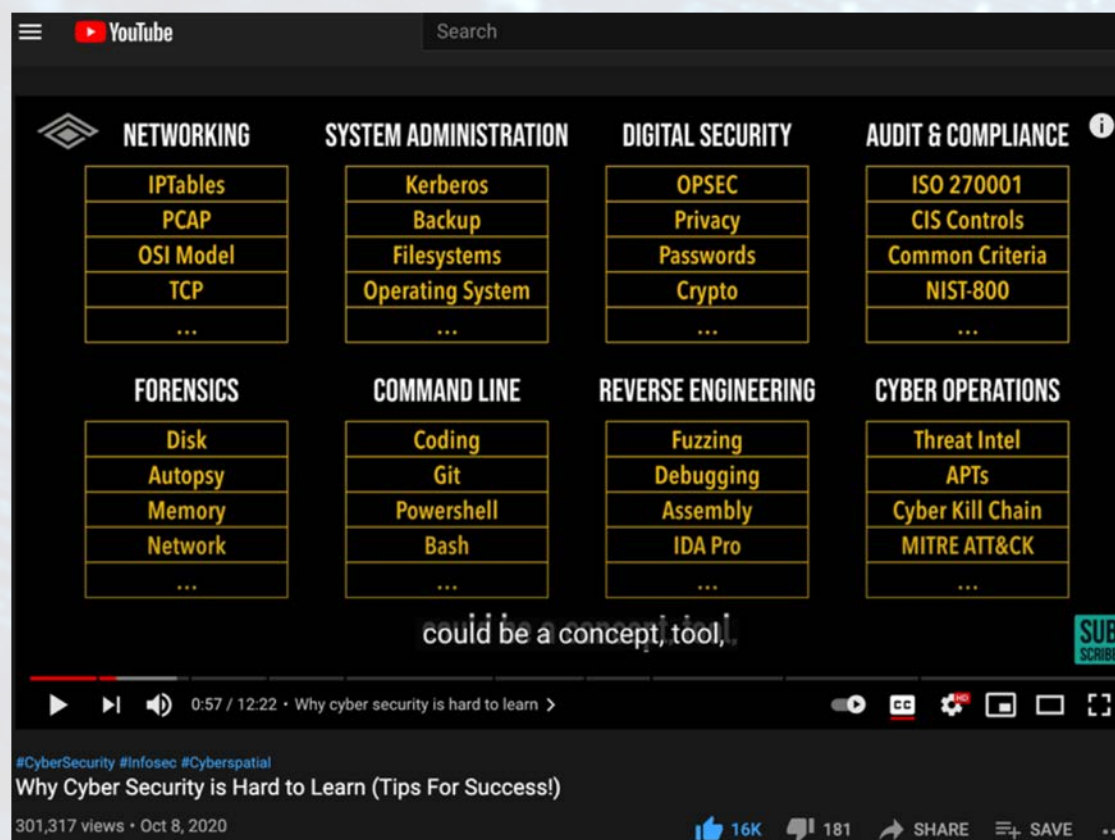
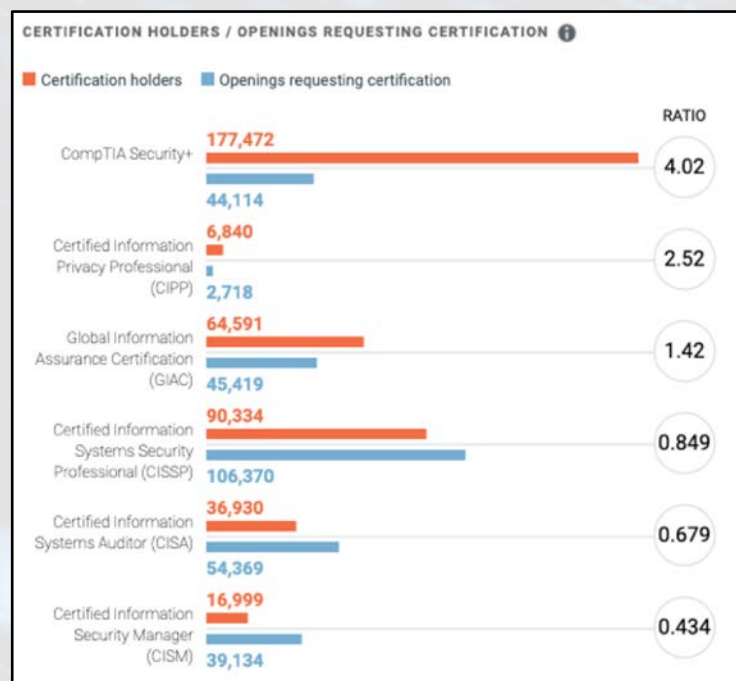
# The Supply Side

Students who aspire cybersecurity career



# Is it easy to get a cybersecurity job?

- ❑ **NO!** Most jobs are at intermediate level, **not beginner**
- ❑ You need to know many areas and have hands-on experience
- ❑ Internships are rare



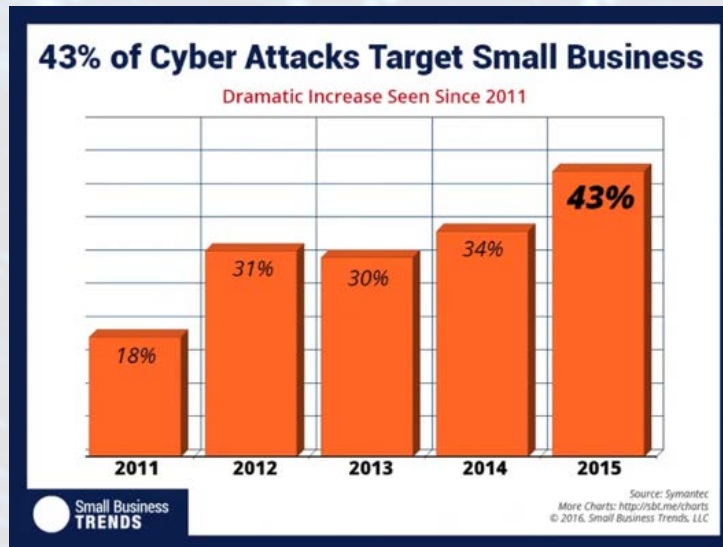
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# **Demand for Cybersecurity in Small Business**



# Attacks on Small Business

- ❑ Small businesses are easier targets, more lucrative → growing attacks



- ❑ **23%** of small businesses had suffered at least one cyber attack in the last 12 months.
- ❑ Average cost of cyber attacks is **\$25,612** (or **\$955,429**)
- ❑ **60%** of victim small businesses go out of business within six months.

# The concerns (Dec 2020)

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- ❑ <https://www.fundera.com/resources/small-business-cyber-security-statistics>
- ❑ **66% of small businesses** are concerned or **extremely concerned** about cyber security risk.
- ❑ **47% of small businesses** they have **no understanding** of how to protect themselves against cyber attacks.
- ❑ **3 out of 4 small businesses** say they **don't have the personnel** to address IT security.
- ❑ **83% of small businesses** **haven't put cash aside** for dealing with a cyber attack.
- ❑ **54% of small businesses** **don't have a plan** in place for reacting to cyber attacks.
- ❑ **65% of small businesses** **have failed to act** following a cyber security incident
- ❑ **40% of small businesses** experienced **eight or more hours** of downtime due to a cyber breach



# Any support for small business?

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- ❑ Many web sites, brochures, webinars, workshops exist
  - <https://www.fcc.gov/general/cybersecurity-small-business>
  - <https://www.sba.gov/business-guide/manage-your-business/stay-safe-cybersecurity-threats>
  - <https://www.ftc.gov/tips-advice/business-center/small-businesses/cybersecurity>
- ❑ The truth
  - Small business owners and employees don't have technical background, time, or expertise to learn and practice cybersecurity
  - They want people to visit and solve the problem on site → costs \$\$\$
- ❑ **Almost no real support exists!**



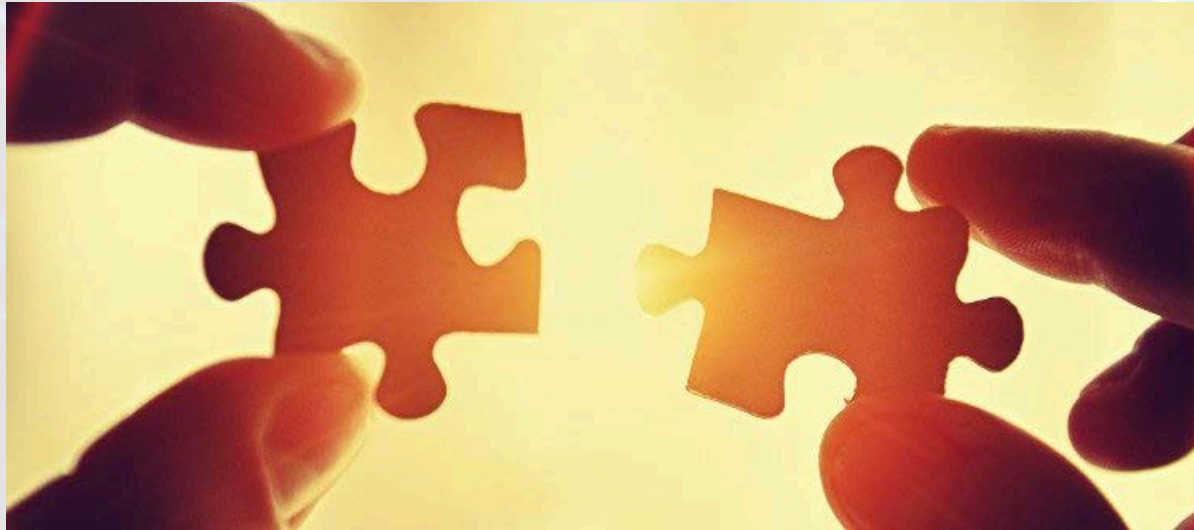
# Our Plan



# Match making

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- ❑ **Small businesses** need well-trained cybersecurity personnel who can visit their sites to fortify cybersecurity for free (or minimum charge)



- ❑ **Students** need to build experience for getting a job
  - An opportunity to Layer Zero

# Real-world actions for Layer Zero

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- ❑ Survey IT systems and evaluate the security posture on site
- ❑ Configure IT/security systems (phishing protection, ransomware protection, installing anti-virus, setting up firewall / wireless access point / routers, password audit, desktop, data encryption, cloud data, etc.)
- ❑ Developing customized security policy, business continuity plan, disaster recovery plan
- ❑ Advanced service (vulnerability scanning, pen-testing web server / file servers)
- ❑ Train employees on site
- ❑ Recommend purchases
- ❑ Make suggestions for improvements
- ❑ **All on-site physically!**



# Possible training program

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Levels	Criteria	Capability
Level 1	No experience at all	Cannot perform any service (but observation allowed)
Level 2	Taken security courses Taken some internal training programs	Can perform generic services
Level 3	Passed CEH or CISSP Taken all internal training programs Performed at least 10 services	Can perform advanced services.  Will teach other trainees in training courses

# Any Interest?

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- ❑ It is not going to happen without sufficient interests from Layer Zero members
- ❑ Need a commitment for training, on-site consulting, and certifications





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# Cybersecurity At UNLV

# Related Courses

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- ❑ CS 445/645 Internet Security (Spring semesters)
  - Certified Ethical Hacker (CEH) certification exams will be offered
- ❑ CS 443 Information Assurance (Summer and Fall Semesters)
- ❑ CS 448/648 Computer Security (Fall Semesters)
- ❑ CS 449 Computer and Internet Forensics (Spring Semesters)
- ❑ CS 465 Computer Networks I (Fall Semesters)



# Degree Programs

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- ❑ MS in cybersecurity (with Lee Business College)
- ❑ Computer Science B.A. in Cybersecurity (from Spring 2022?)



# Did You Know?

## UNLV is the NSA / DHS National Center of Academic Excellence (CAE) in Cyber Defense

The goal of these designations is to reduce vulnerability in our national information infrastructure by promoting higher education and research in IA and producing a growing number of professionals with IA expertise in various disciplines.

Students attending CAE designated schools are eligible to apply for scholarships and grants through the Department of Defense Information Assurance Scholarship Program and the Federal Cyber Service Scholarship for Service Program.

CAE-CD receives formal recognition from the U.S. Government as well as opportunities for prestige and publicity for their role in securing our Nation's information systems.





# DoD Cyber Scholarship Program (CySP)

Information for Nominees

DoD, Chief Information Officer (DCIO), Cybersecurity, Cyber Workforce Management



<https://public.cyber.mil/dcysp/>

**DoD CYBER SCHOLARSHIP PROGRAM (DOD CYSP)**

DoD Cyber Scholarship Program (DoD CySP)

Documents Library

Help

## DoD Cyber Scholarship Program (DoD CySP)

### WELCOME TO THE DOD CYBER SCHOLARSHIP PROGRAM (DOD CYSP)

The DoD CySP is both a scholarship program for the DoD, and a capacity building tool for the nation. The program is a result of commitment from DoD and Congress to support higher education as a means to prepare the DoD workforce to deal with threats against the Department's critical information system and networks.

Given our increasing reliance on cybersecurity, information technology (IT), the growing threats to information, and information systems and infrastructures, it is critical that the Department of Defense (DoD) protect itself. To do so, the DoD must be staffed with technically savvy personnel. To help achieve this task, the DoD Cyber Scholarship Program (DoD CySP) was established. The DoD CySP is sponsored by the DoD Chief Information Office and administered by the National Security Agency (NSA). The objectives of the program are to promote higher education in all disciplines of cybersecurity, to enhance the Department's ability to recruit and retain cyber and IT specialists, to increase the number of military and civilian personnel in the DoD with this expertise, and ultimately, to enhance the nation's cyber posture.

# DoD Cyber Scholarship Program (CySP)

Information for Nominees

DoD, Chief Information Officer (DCIO), Cybersecurity, Cyber Workforce Management



- Each student in the program will be supported:
  - A student will be paid a stipend of \$25,000 (undergrad), \$30,000 (grad student) per academic year.
  - The scholarship will pay for the full cost of tuition, required fees, books, and a stipend to cover room and board.
  - DoD will also provide sponsors who will maintain contact with the student during the scholarship period, and who will facilitate the student's entry into internships and eventual DoD employment.

If you are interested in applying for the scholarship, please email me ([Juyeon.Jo@unlv.edu](mailto:Juyeon.Jo@unlv.edu)) sometime in early January.



# DoD Cyber Scholarship Program (CySP)

Information for Nominees

DoD, Chief Information Officer (DCIO), Cybersecurity, Cyber Workforce Management



## ❑ Requirements and Eligibility

- U.S. citizen at the time of application and at least 18 years of age.
- Currently enrolled at a CAE with an IA concentration.
- Federal employment criteria may require security clearances (*Note, if family members are not U.S. Citizens, some agencies may be unable to process them through the required security clearances. DoD agencies make every effort to assign eligible students at an agency without such restrictions.*)
- Completion of summer internship facilitated by the National Security Agency (NSA) into a Department of Defense agency
- Upon graduation, each student will be required to work for a DoD agency (*ex. Defense Intelligence Agency, Defense Technical Information Center, National Security Agency*) as a civilian employee. The work requirement time period matches the supported time period.



# Support for DEFCON Conference

## ❑ DEFCON

Aug 8 – Aug 11, 2021, Las Vegas

- Hackers' conference
- Sent 20 students this year





# UNLV GenCyber Camp (Sponsored by NSA and NSF)





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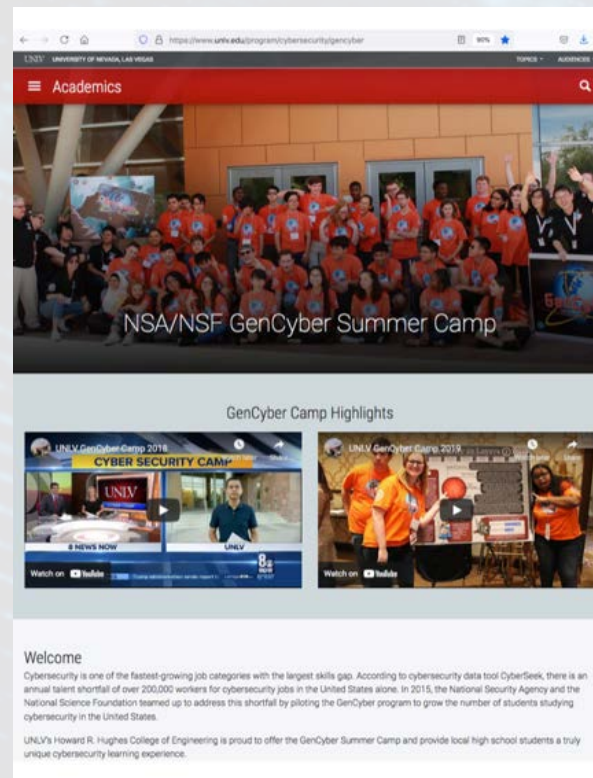




# UNLV GenCyber Camp (Sponsored by NSA and NSF)

Camp Website:

<https://www.unlv.edu/program/cybersecurity/gen cyber>



## ABOUT US



At Layer Zero we have two main goals: provide knowledge in general cyber security and prepare members to compete in National Cyber League's "Capture the Flag".

National Cyber League (NCL) hosts Capture the Flag (CTF) twice a year, a competition where you must find a digital flag using your "hacker" skills. The competition tests your knowledge in several categories, such as cryptography, reverse engineering, web-vulnerabilities and network security. At Layer Zero, we train weekly in order to hone our skills and perform well in CTF.

We also provide resources to prepare members to take the Security+ examination, an entry level certification required by most employers in the Cyber Security Industry.

### OFFICERS



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