



Cyber Security

May 2018

Prepared by the Los Angeles/Orange County Center of Excellence for Labor Market Research

Research Summary

The Los Angeles/Orange County Center of Excellence (COE) compiled this report to provide regional labor market supply and demand data related to **cyber security**.

The following list summarizes key findings from this brief for cyber security:

- The number of jobs for information security analyst is expected to increase by 7% through 2022, resulting in nearly 150 annual job openings.
- The average entry-level hourly wage for information security analysts is **above** the MIT Living Wage¹ estimate for the region.
- **Less than 30%** of the current workforce has some postsecondary coursework training.
- Of the 621 job postings that specified a minimum education, **92% listed a bachelor's degree or higher**, indicating that community college students may not be qualified for these jobs.
- Between 2014 and 2017, community colleges in the county conferred an average of 129 awards (associate degrees and certificates) across two computer programs.

Occupation Codes and Descriptions

Currently, there is one occupation in the standard occupational classification (SOC) system related to cyber security. The occupation title, description, and reported job titles are included in Exhibit 1.

Exhibit 1 – Occupation, description, and sample job titles

| SOC Code | Title | Description | Sample of Reported Job Titles |
|----------|-------------------------------|---|---|
| 15-1122 | Information Security Analysts | Plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. May ensure appropriate security controls are in place that will safeguard digital files and vital electronic infrastructure. May respond to computer security breaches and viruses. | Computer Security Specialist, Computer Specialist, Data Security Administrator, Information Security Analyst, Information Security Manager, Information Security Officer, Information Security Specialist, Information Systems Security Analyst, Information Technology Security Analyst, Information Technology Specialist |

Source: O*NET Online

¹ MIT Living Wage Calculator. <http://livingwage.mit.edu/>

Current and Future Employment

In Los Angeles County, the number of information security analyst jobs are expected to increase by 7% over the next five years. Nearly 150 job opportunities will be available annually for this occupation through 2022 due to new job growth and replacement need (e.g., retirements). Exhibit 2 contains detailed employment projections data for this occupation.

Exhibit 2 – Five-year projections for information security analysts

| SOC | Occupation | 2017 Jobs | 2022 Jobs | 2017 - 2022 Change | 2017 - 2022 % Change | Annual Openings |
|---------|-------------------------------|-----------|-----------|--------------------|----------------------|-----------------|
| 15-1122 | Information Security Analysts | 1,830 | 1,950 | 120 | 7% | 148 |

Source: EMSI 2018.2 – QCEW, non-QCEW, Self-Employed.

Earnings

In Los Angeles County, the entry-level average wage for information security analysts is \$30.06 per hour, which is significantly above the MIT Living Wage estimate of \$13.54 per hour for a single adult. The average annual earnings for information security analysts in the region is \$104,613 per year, assuming full-time employment.

Exhibit 3 contains hourly wages and annual average earnings for the occupation studied in this report. Entry-level hourly earnings is represented by the 10th percentile of wages, median hourly earnings is represented by the 50th percentile of wages, and experienced hourly earnings is represented by the 90th percentile of wages, demonstrating various levels of employment.

Exhibit 3 – Earnings for information security analysts

| SOC | Occupation | Entry-Level Hourly Earnings | Median Hourly Earnings | Experienced Hourly Earnings | Average Annual Earnings |
|---------|-------------------------------|-----------------------------|------------------------|-----------------------------|-------------------------|
| 15-1122 | Information Security Analysts | \$30.06 | \$50.69 | \$71.91 | \$104,613 |

Source: EMSI 2018.2 – QCEW, non-QCEW, Self-Employed.

Employer Job Postings

In this research brief, real-time labor market information is used to provide a more nuanced view of the current job market, as it captures job advertisements for occupations relevant to the field of study. Employer job postings are consulted to understand who is employing in the field of cyber security, and what they are looking for in potential candidates. To identify job postings related to cyber security, the SOC Code for information security analysts (15-1122) was used.

Top Titles

The most common titles for cyber security-related jobs are listed in Exhibit 4. Security engineer was mentioned in 10% of all relevant job postings (84 out of 813 postings).

Exhibit 4 –Job titles (n=813)

| Title | Job Postings, Full Year 2017 |
|--------------------------------|------------------------------|
| Security Engineer | 84 |
| Security Analyst | 83 |
| Information Security Engineer | 63 |
| Cyber Security Engineer | 59 |
| Security Manager | 58 |
| Security Consultant | 52 |
| Cyber Security Specialist | 25 |
| Information Security Analyst | 20 |
| Information Assurance Engineer | 18 |
| Information Security Manager | 17 |

Source: Labor Insight/Jobs (Burning Glass)

Top Employers

Exhibit 5 lists the major employers hiring professionals in the field of cyber security. Top employers postings job ads included Booz Allen, Northrop Grumman, and UnitedHealth. The top worksite cities in the region for these occupations were: Los Angeles, El Segundo, Pasadena, Santa Monica, and Glendale.

Exhibit 5 – Top employers (n=600)

| Employer | Job Postings, Full Year 2017 |
|--------------------------|------------------------------|
| Booz Allen Hamilton Inc. | 44 |
| Northrop Grumman | 41 |
| UnitedHealth Group | 38 |
| SAIC | 27 |
| Deloitte | 24 |

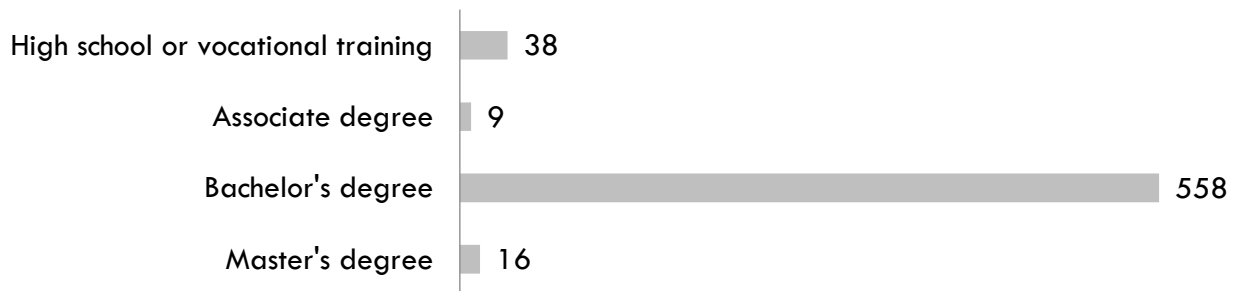
| | |
|-----------------------------|----|
| Raytheon | 20 |
| ManTech International Corp. | 19 |
| Disney | 15 |
| Aerospace Corporation | 13 |
| Wells Fargo | 13 |
| Accenture | 11 |

Source: Labor Insight/Jobs (Burning Glass)

Advertised Education Levels

Exhibit 6 displays the education level requested by employers in online job ads. The majority of employers were looking for a candidate with a Bachelor’s degree. Approximately 24% of job postings did not specify a level of education.

Exhibit 6 – Advertised education requirements for cyber security-related occupations (n=621)



Source: Labor Insight/Jobs (Burning Glass)

Education and Training

Exhibit 7 shows the typical entry-level education requirement for the occupations of interest, along with the typical on-the-job training, and percentage of workers in the field who hold a community college award or have completed some postsecondary courses. About 28% of the workforce has completed some community college education as their highest level of education.

Exhibit 7 – Education and training requirements

| SOC | Occupation | Typical entry-level education | Typical on-the-job training | % of Community College Award Holders or Some Postsecondary Coursework |
|---------|-------------------------------|-------------------------------|-----------------------------|---|
| 15-1122 | Information Security Analysts | Bachelor's degree | None | 28% |

Source: EMSI, Bureau of Labor Statistics Employment Projections (Educational Attainment)

In Los Angeles County, eight community colleges have conferred awards in cyber security. Between 2014 and 2017, there was an average of 129 community college awards conferred annually across the two programs below. It is important to note that an award is not equivalent to a single person in search of a job opening, since a student may earn more than one award (e.g. an associate degree and a certificate).

Exhibit 8 – CCC Student Awards (by TOP and College)

| TOP Code | Program | College | 2014-15 Awards | 2015-16 Awards | 2016-2017 Awards | 3-Year Award Average |
|-------------------------|-------------------------------------|----------------|----------------|----------------|------------------|----------------------|
| 0708.10 | Computer Networking | Cerritos | 5 | 5 | 10 | 7 |
| | | LA City | 9 | 6 | 11 | 9 |
| | | LA Pierce | 16 | 21 | 32 | 23 |
| | | Long Beach | 12 | 11 | 25 | 16 |
| | | Mt San Antonio | 11 | 2 | 9 | 7 |
| | | West LA | 35 | 55 | 47 | 46 |
| Subtotal/Average | | | 88 | 100 | 134 | 107 |
| 0708.00 | Computer Infrastructure and Support | Citrus | 6 | 9 | N/A | 8 |
| | | LA Valley | N/A | N/A | 3 | 3 |
| | | Long Beach | 1 | 1 | 1 | 1 |
| | | Mt San Antonio | 15 | 12 | 16 | 14 |
| Subtotal/Average | | | 22 | 22 | 20 | 21 |
| Total/Average | | | 110 | 122 | 154 | 129 |

Source: California Community Colleges Chancellor’s Office MIS Data Mart

Student Outcomes

The CTE LaunchBoard provides student outcome data on the effectiveness of CTE programs. The following student outcome information was collected from exiters of the Computer Networking Taxonomy of Program (TOP) code (0708.10) in Los Angeles County for the 2015-16 academic year.

- The median earnings in the second fiscal quarter after program completion is \$8,402
- 60% of students are earning a living wage
- 60% of students are employed within six months after completing a program

The following student outcome information was collected from exiters of the Computer Infrastructure and Support Taxonomy of Program (TOP) code (0708.00) in Los Angeles County for the 2015-16 academic year.

- The median earnings in the second fiscal quarter after program completion is \$8,508
- 54% of students are earning a living wage
- 65% of students are employed within six months after completing a program

Source: CTE LaunchBoard

Sources

O*Net Online, Labor Insight/Jobs (Burning Glass), Economic Modeling Specialists International (EMSI), MIT Living Wage Calculator, Bureau of Labor Statistics (BLS) Education Attainment, California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart, CTE LaunchBoard, Statewide CTE Outcomes Survey, Employment Development Department Unemployment Insurance Dataset

Notes

Data included in this analysis represents the labor market demand for positions most closely related to cyber security. Standard occupational classification (SOC) codes were chosen based on the national education level required for employment (associate degree and postsecondary certificate) as well as the proportion of current workers who hold a community college award or have had some community college training. This selection process narrows the labor market analysis to the most relevant employment opportunities for students with community college education and/or training.

Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study and should not be used to establish current job openings, because the numbers may include duplicate job postings or postings intended to gather a pool of applicants. Real-time labor market information can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.