



BACCALAUREATE DEGREE PROGRAM LABOR MARKET ANALYSIS:

0708.00 COMPUTER INFRASTRUCTURE AND SUPPORT

11.1003 COMPUTER AND INFORMATION SYSTEMS SECURITY/AUDITING/
INFORMATION ASSURANCE



FOR LABOR MARKET RESEARCH
INLAND EMPIRE/DESERT

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Introduction

The Inland Empire/Desert (IED) Center of Excellence for Labor Market Research (COE) has prepared this report to support the program review process for a community college baccalaureate degree, specifically 0708.00 Computer Infrastructure and Support and 11.1003 Computer and Information Systems Security/Auditing/Information Assurance. The report provides an analysis of student outcomes data, employment, and earnings to assess the level of workforce demand in support of this program.

Additionally, the report assesses the labor market demand for the following occupations:

- Information Security Analysts
- Computer Network Support Specialists
- Computer Network Architects
- Network and Computer Systems Administrators
- Computer Systems Analysts

The proposed program is structured around the following foundational design elements:

- Cloud Computing
- Computer Networking
- Cybersecurity

EXECUTIVE SUMMARY

The Inland Empire/Desert Center of Excellence for Labor Market Research prepared this report to provide a labor market analysis of educational supply and occupational demand for cloud computing and cybersecurity careers in the San Bernardino and Riverside counties. This report aims to determine if a particular occupational group is an appropriate candidate for a community college baccalaureate degree program.

Key Findings:

- Education
 - Four of the five occupations typically require a bachelor's degree for entry-level employment, with the remaining occupation requiring an associate degree. The four occupations typically requiring a bachelor's degree account for the vast majority of annual job openings (96.8%). In the past year, a majority of job postings across the state either required (74.2%) or preferred (79.4%) workers with a bachelor's degree.
 - When taken together, the annual job openings related to occupations which typically require a bachelor's degree (+8,235) and number of job postings requiring or preferring a bachelor's degree (+70%) demonstrate that employers in this occupational group often require new workers to hold a bachelor's degree level of education.
- Wages
 - Statewide: Entry-level hourly wages for job postings for these five cloud computing and cybersecurity occupations from employers requiring a bachelor's degree are 19% higher when compared to those that required an associate degree and 54% higher when compared to those that required a high school diploma or equivalent. Similarly, median wages for job postings from employers requiring a bachelor's degree are 21.1% higher when compared to those that required an associate degree and 52.5% higher when compared to those that required a high school diploma or equivalent. This provides evidence that employers will consistently pay higher wages to bachelor's degree holders across their career progression.
 - Regional: Entry level wages for four of the five cloud computing and cybersecurity occupations exceed the self-sufficiency standard target of \$34.35/hour by amounts ranging from \$3 to \$10. However, the remaining occupation is below this standard by \$7. As a percentage of annual job openings, the vast majority of occupations (96.8%) have entry level wages above the self-sufficiency standard for the Inland

Empire-Desert region. This provides evidence that entry level workers in the field are likely to earn a regional living wage.

- Job Demand
 - Statewide: From Apr 2025 – Mar 2026, there were 25,414 unique job postings for cloud computing and cybersecurity occupations from 5,365 employers.
 - Statewide: From 2024-2034, there is projected to be an average of 9,118 new and replacement job openings each year; this translates to a projected 10-year increase of 8.7%. This provides evidence that there will be increasing demand across the state over the next decade.
 - Regional: From 2024-2034, there is projected to be an average of 406 new and replacement job openings each year; this translates to a projected 10-year increase of 10.2%. This provides evidence that there will be substantial demand across the region over the next decade.
- Supply Gap
 - Based on a projected regional supply of 185 awards, and a projected regional demand of 406 annual job openings, there is projected to be a supply gap of 221 workers each year in the Inland Empire/Desert region. This provides evidence that, even with additional supply of workers from this proposed program, there will continue to be unmet demand from regional employers.

STATE DATA ANALYSIS

The following sections analyze labor market data for this cloud computing and cybersecurity occupational group in California to establish the relevancy of the occupation for preparation at the baccalaureate level, to quantify the employer preference (or lack of preference) for bachelor's degree-level workers, and to detail other characteristics employers are considering when hiring for these occupations.

To better understand the statewide job market for professionals entering the field, the report includes 10-year employment projections with expected annual job openings.

Educational Requirements, Certifications, and Degree Alignment

In an effort to identify the preferred education and training levels for workers in this occupational group, Exhibit 1 includes the typical education, work experience, and on-the-job training needed for entry level cloud computing and cybersecurity workers.

EXHIBIT 1.

Typical entry-level education and job requirements

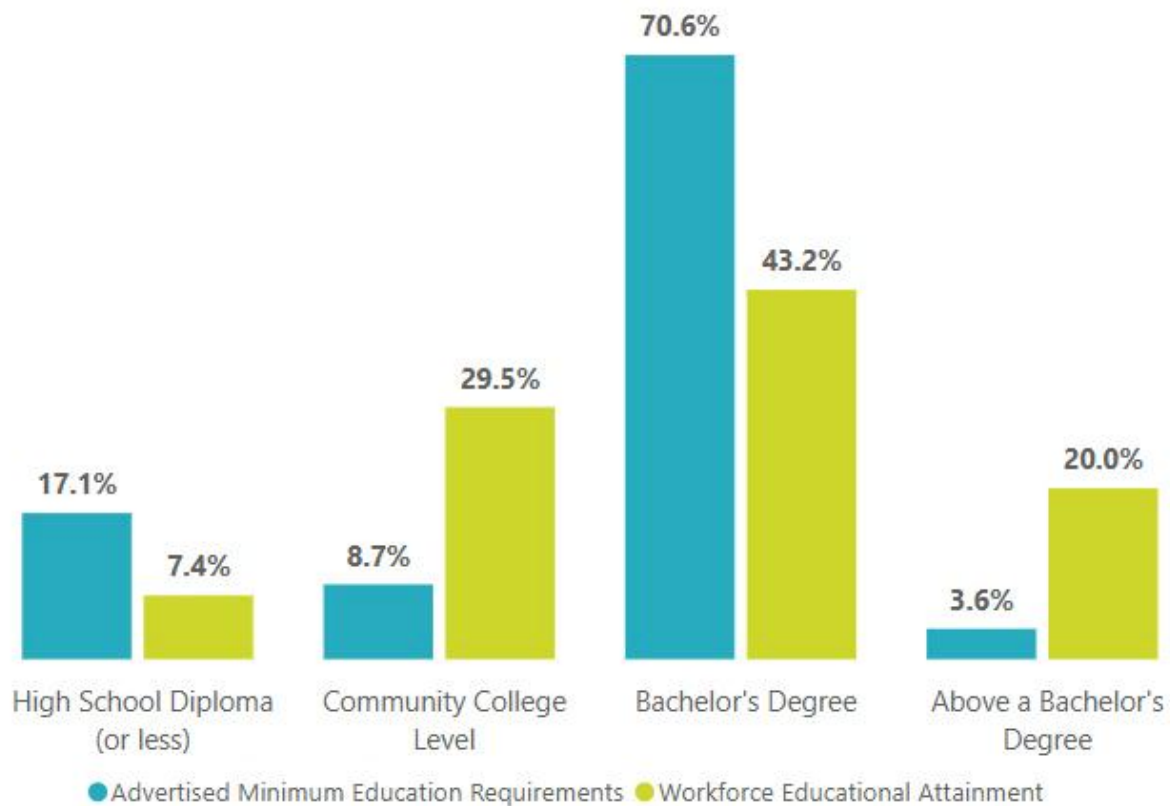
SOC	Occupation	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
15-1211	Computer Systems Analysts	Bachelor's degree	None	None
15-1212	Information Security Analysts	Bachelor's degree	Less than 5 years	None
15-1231	Computer Network Support Specialists	Associate's degree	None	None
15-1241	Computer Network Architects	Bachelor's degree	5 years or more	None
15-1244	Network and Computer Systems Administrators	Bachelor's degree	None	None

SOURCE: BLS TRAINING AND EDUCATION LEVELS, [HTTPS://WWW.BLS.GOV/EMP/DOCUMENTATION/EDUCATION/TECH.HTM](https://www.bls.gov/emp/documentation/education/tech.htm)

Exhibit 2 compares education attainment for the occupation, which is the highest degree or level of education attained by workers aged 25 or older in cloud computing and cybersecurity positions, against the minimum education requirements aggregated from job postings across California. A large percentage of workers (63.2%) in this occupation currently hold a bachelor's degree or higher. The majority (43.2%) have a bachelor's degree, while the remaining 20.0% report a master's or doctorate degree. Similarly, a minority (74.2%) of job postings that specify a minimum education requirement list a bachelor's degree or above as the minimum qualification.

EXHIBIT 2.

Workforce Education Attainment and Job Posting Minimum Education Requirements,
Job Postings from Apr 2025 - Mar 2026



SOURCE: LIGHTCAST 2026.1; BLS 2024

Our analysis indicates no licenses or certifications are required to join the occupations in this occupational group in the state of California.

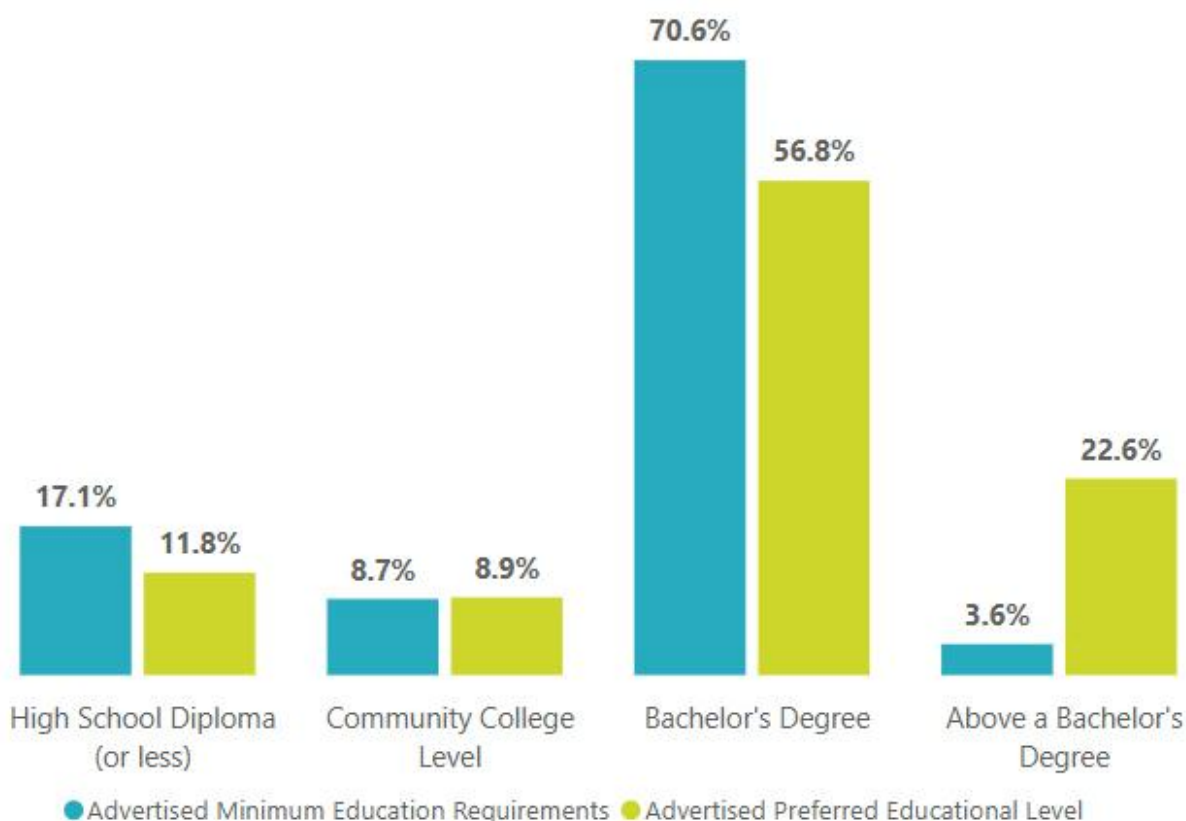
Preference for Bachelor's Degree Holders

In an effort to establish evidence that employers prefer entry level workers with bachelor's degrees, Exhibit 3 shows the percentage of job postings that have both minimum education requirements and preferred education requirements for candidates for cloud computing and cybersecurity positions. The majority (56.8%) of job postings with an education requirement listed bachelor's degree or above as the minimum requirement for this occupation in the past 12 months. Similarly, the vast majority (70.6%) of job postings with an education requirement listed bachelor's degree or above as the preferred requirement for this occupation in the past 12 months.

Exhibit 1 above demonstrates that four of the five occupations typically require a bachelor's degree for entry-level employment, while the remaining occupation requires an associate degree. Over the past 12 months, the majority of job postings within the state required (74.2%) or preferred (79.4%) qualifications greater than or equal to a bachelor's degree (seen to Exhibit 3). Therefore, there is strong evidence that a bachelor's degree is consistently required for positions in this group of occupations.

EXHIBIT 3.

Job Postings, Minimum and Preferred Education Requirements, California,
Apr 2025 - Mar 2026



SOURCE: LIGHTCAST 2026.1

Work Experience

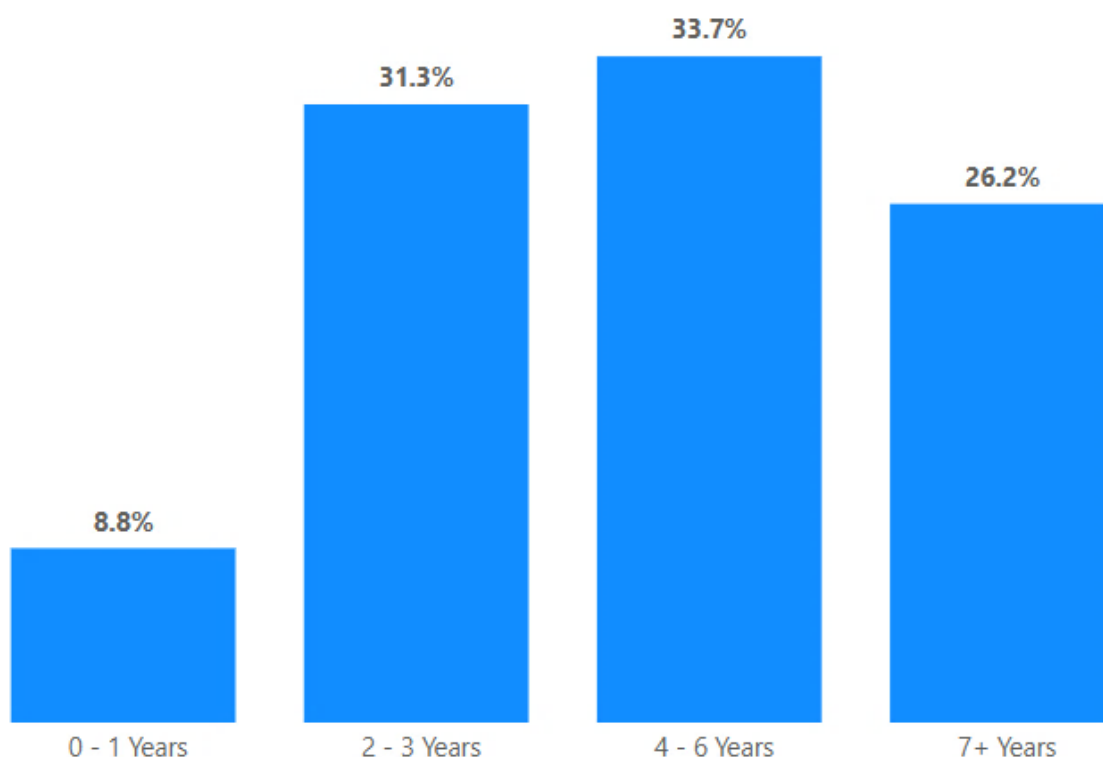
In an effort to establish evidence that employers prefer workers with a specific level of previous job experience, Exhibit 4 includes the distribution of minimum work experience requirements advertised in job postings for cloud computing and cybersecurity occupations across California. The two largest grouping of job postings for this occupational group require a minimum of 4-6 years or 2-3 years of previous work

experience, 33.7% and 31.3% of the total respectively, while fewer required 0-1 years (8.8%) or 7+ years (26.2%) of previous work experience.

Due to the preference for more than 2 years of previous work experience, the majority of this occupational group's entry level workers should have previous experience in the industry in other related roles to gain employment. Gathering more information from employers on what qualifies as acceptable work experience is recommended.

EXHIBIT 4.

Work Experience Required, Job Posting Data, California, Apr 2025 - Mar 2026



SOURCE: LIGHTCAST 2026.1

Salary Differentials

In an effort to establish evidence that employers offer higher salaries to entry-level workers with a bachelor's degree, we analyzed 25,414 job ads posted in the state for cloud computing and cybersecurity occupation ads: (a) job postings that require a minimum education requirement of high school diploma and (b) associate degree and (c) bachelor's degree. Additionally, wages from all five occupations were averaged to generate a single data point for each wage percentile.

Exhibit 5 displays the entry level (25th Pct.) hourly wage advertised in job postings that require a minimum education requirement of high school diploma (\$29.54) and associate degree (\$38.35) and bachelor's degree (\$45.56) This demonstrates that the advertised entry level wages for job postings are 18.8% higher for job postings that require a minimum of a bachelor's degree when compared to entry level wages for job postings that require a minimum of an associate degree and 54.2% higher when compared to entry level wages for job postings that require a minimum of a high school diploma or GED.

EXHIBIT 5.

Job Posting Hourly Wages (Averaged Across Occupations),
Minimum Education Requirements, California, Apr 2025 - Mar 2026



SOURCE: LIGHTCAST 2026.1

Employment Outlook

In an effort to establish evidence that this occupation has a positive employment outlook in the state, this section analyzes job demand projection data from 2024-2034. In 2024, California had 139,423 positions for cloud computing and cybersecurity occupations. Projections indicate an increase to 151,492 positions by 2034, as detailed in Exhibit 6. Annually, there is an average of 9,118 new and replacement job openings expected. This represents 8.7% growth in the number of these roles over the next decade, as illustrated in Exhibit 7.

EXHIBIT 6.

Projected Jobs by Year, California, 2024-2034

SOC	Occupation	2024 Jobs	2025 Jobs	2026 Jobs	2027 Jobs	2028 Jobs	2029 Jobs
15-1211	Computer Systems Analysts	57,960	57,676	58,542	59,281	59,947	60,553
15-1212	Information Security Analysts	17,909	18,181	18,770	19,324	19,833	20,308
15-1231	Computer Network Support Specialists	12,434	12,394	12,513	12,625	12,733	12,828
15-1241	Computer Network Architects	20,428	20,283	20,596	20,877	21,130	21,364
15-1244	Network and Computer Systems Administrators	30,692	30,377	30,504	30,612	30,691	30,742
Total		139,423	138,911	140,925	142,719	144,334	145,795

SOC	Occupation	2030 Jobs	2031 Jobs	2032 Jobs	2033 Jobs	2034 Jobs
15-1211	Computer Systems Analysts	60,936	61,483	61,986	62,441	62,856
15-1212	Information Security Analysts	20,700	21,135	21,548	21,932	22,293
15-1231	Computer Network Support Specialists	12,878	12,969	13,042	13,116	13,174
15-1241	Computer Network Architects	21,547	21,777	21,989	22,181	22,366
15-1244	Network and Computer Systems Administrators	30,689	30,739	30,773	30,796	30,803
Total		146,749	148,103	149,337	150,466	151,492

SOURCE: LIGHTCAST 2025.4

EXHIBIT 7.

Projected Job Growth and Annual Job Openings, California, 2024-2034

SOC	Occupation	2024 Jobs	2034 Jobs	Job Growth	Avg. Annual Openings
15-1211	Computer Systems Analysts	57,960	62,856	8.4%	3,881
15-1212	Information Security Analysts	17,909	22,293	24.5%	1,479
15-1231	Computer Network Support Specialists	12,434	13,174	6.0%	883
15-1241	Computer Network Architects	20,428	22,366	9.5%	1,256
15-1244	Network and Computer Systems Administrators	30,692	30,803	0.4%	1,620
Total		139,423	151,492	8.7%	9,118

SOURCE: LIGHTCAST 2026.1

REGIONAL DATA ANALYSIS

To compare projected demand and program supply, the following section analyzes historical employment trends over the past decade for target occupations in the region, details projected demand through 10-year forecasts, annual average job openings, and the supply of graduates from comparable higher education programs, including projections from new programs. Also included is a comparison of entry-level wages for these occupations with the living wage requirements for both single adults and single parents with one child in the region.

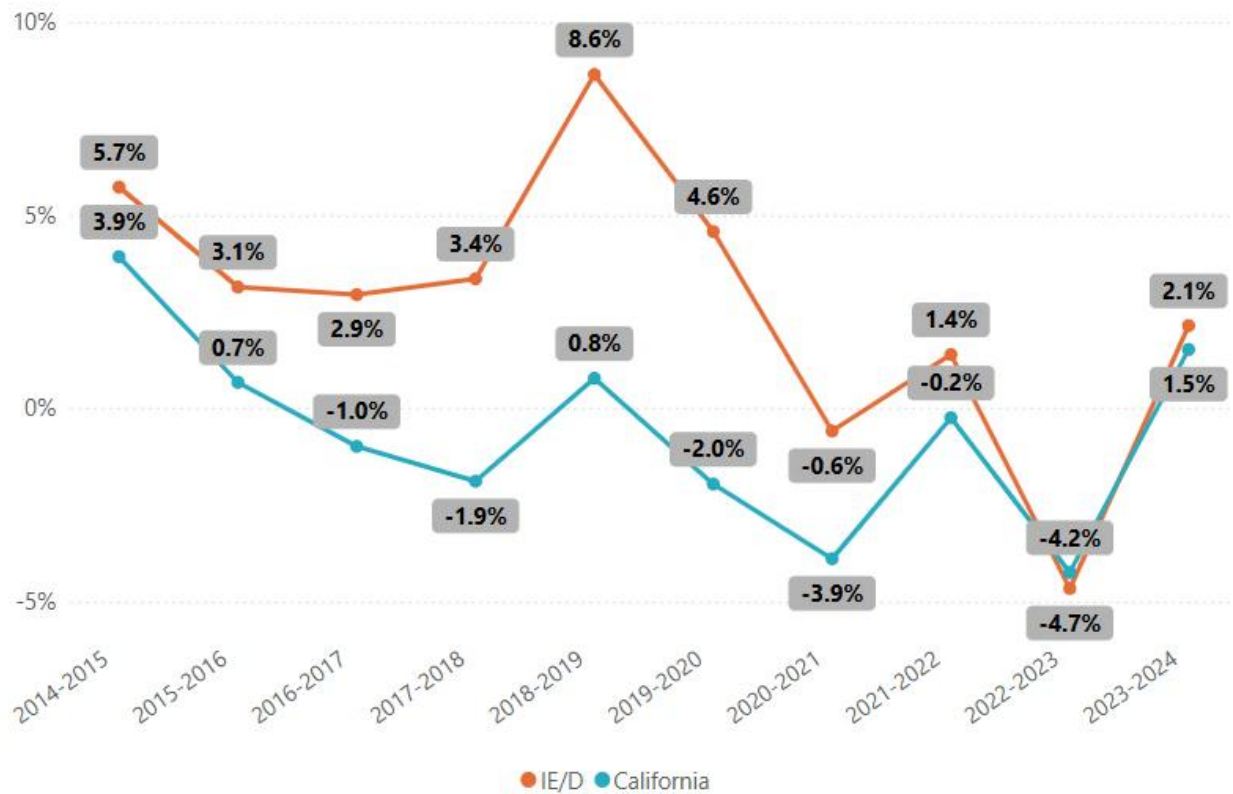
Employment Trends and Projections

In an effort to establish if this occupation has a positive employment outlook in the Inland Empire/Desert region, this section analyzes historic job change data from 2014-2024 and projected employment from 2024-2034.

Exhibit 8 shows the year-over-year job change for cloud computing and cybersecurity occupations in both the Inland Empire-Desert region and California from 2014-2024. This indicates that the growth of this occupational group in both regions has been slightly unpredictable but shifts in most years do not appear to align directionally between the two datasets, with California trending to more negative growth as the decade progressed, while the IED region saw generally positive growth except for the 2020-21 and 2022-23 periods.

EXHIBIT 8.

Historic Job Percent Change by Year, Cloud Computing and Cybersecurity Occupations, Inland Empire-Desert Region and California, 2014-2024



SOURCE: LIGHTCAST 2026.1

As shown in Exhibit 9, in 2014, there were 4,761 jobs for cloud computing and cybersecurity occupations in the IED region as compared to 6,160 jobs in 2024. This represents a 22.7% increase in the number of jobs in the region over the period, while California saw a 6.8% decrease. Since 2014, this group of occupations has seen an average annual growth rate of 2.7% in the IED region.

EXHIBIT 9.

Historical Employment, Inland Empire-Desert Region and California, 2014-2024

SOC and Description	2014 Jobs	2024 Jobs	Job Growth
15-1211 Computer Systems Analysts			
IE/D	1,824	2,439	33.7%
California	64,664	57,960	-10.4%
15-1212 Information Security Analysts			
IE/D	222	547	146.5%
California	8,721	17,909	105.4%
15-1231 Computer Network Support Specialists			
IE/D	763	738	-3.3%
California	18,045	12,434	-31.1%
15-1241 Computer Network Architects			
IE/D	481	650	35.1%
California	15,920	20,428	28.3%
15-1244 Network and Computer Systems Administrators			
IE/D	1,471	1,787	21.5%
California	41,616	30,692	-26.2%
Total IE/D	4,761	6,160	22.7%
Total California	148,966	139,423	-6.8%

SOURCE: LIGHTCAST 2026.1

Exhibit 10 displays the projected job demand for this occupational group, which will be compared to the projected supply of graduates from similar programs in the region in a later section. In 2024, there were 6,160 jobs for cloud computing and cybersecurity occupations in the region, with projections indicating an increase to 6,789 jobs by 2034, a 10.2% increase, as shown in Exhibit 11.

EXHIBIT 10.

Projected Jobs by Year, Inland Empire-Desert Region, 2024-2034

SOC	Occupation	2024 Jobs	2025 Jobs	2026 Jobs	2027 Jobs	2028 Jobs	2029 Jobs
15-1211	Computer Systems Analysts	2,439	2,448	2,494	2,532	2,566	2,596
15-1244	Network and Computer Systems Administrators	1,787	1,784	1,801	1,813	1,824	1,832
15-1231	Computer Network Support Specialists	738	736	747	757	766	773
15-1241	Computer Network Architects	650	651	665	676	688	698
15-1212	Information Security Analysts	547	558	577	595	612	628
Total		6,160	6,176	6,284	6,374	6,456	6,528

SOC	Occupation	2030 Jobs	2031 Jobs	2032 Jobs	2033 Jobs	2034 Jobs
15-1211	Computer Systems Analysts	2,615	2,641	2,665	2,686	2,703
15-1212	Information Security Analysts	642	657	670	683	696
15-1231	Computer Network Support Specialists	776	784	789	794	798
15-1241	Computer Network Architects	706	716	727	734	742
15-1244	Network and Computer Systems Administrators	1,831	1,839	1,845	1,848	1,850
Total		6,571	6,637	6,697	6,746	6,789

SOURCE: LIGHTCAST 2026.1

EXHIBIT 11.

Projected Job Growth and Annual Job Openings, Inland Empire-Desert Region, 2024-2034

SOC	Occupation	2024 Jobs	2034 Jobs	Job Growth	Avg. Annual Openings
15-1211	Computer Systems Analysts	2,439	2,703	10.9%	168
15-1212	Information Security Analysts	547	696	27.2%	47
15-1231	Computer Network Support Specialists	738	798	8.1%	53
15-1241	Computer Network Architects	650	742	14.2%	43
15-1244	Network and Computer Systems Administrators	1,787	1,850	3.5%	95
Total		6,160	6,789	10.2%	406

SOURCE: LIGHTCAST 2026.1

Exhibit 11 displays an expected average of 406 new and replacement job openings annually, representing a 10.2% increase over the next decade which is greater than the statewide growth of 8.7% for the same timeframe.

Occupational Wages

To determine if entry level wages for this occupation meet or exceed a self-sufficiency standard in the Inland Empire/Desert region, this section compares occupation wage estimates against the regional self-sufficiency standard. Exhibit 12 displays the hourly earnings by quartile for cloud computing and cybersecurity occupations and compares those to the UW Self-Sufficiency Standard for the IE/D against a variety of family-size scenarios. However, the primary self-sufficiency benchmark includes one adult and one school-age child, \$34.35¹. This can be compared to the 25th percentile hourly earnings, which are generally considered entry level wages for an occupation.

When compared to the self-sufficiency standard, one adult and one school-age child, the entry level wages for four of the five occupations are above the target (\$34.35) by almost \$3-\$10. However, the remaining occupation (Computer Network Support Specialists) has entry level wages \$7 below this standard. This denotes that this occupational field is well positioned to provide a self-sustaining wage for new entrants to the field.

¹ The [UW self-sufficiency standard](#) is currently used by the CCCC and COE; the self-sufficiency standard was last updated by UW in 2024. UW estimates the living wage for an adult with one school-age child living in 2024 is \$34.35 in Riverside County and \$33.50 in San Bernadino County. The higher of the two is used to determine the single standard, \$34.35.

EXHIBIT 12.

Occupational Wage Estimates, Inland Empire-Desert Region, 2024-2034

Hourly Self-Sufficiency Standard				
1 Adult	Adult + Infant	Adult + Preschool Child	Adult + School-age Child	Adult + Teen
\$20.76	\$38.88	\$36.10	\$34.35	\$27.66

SOC	Occupation	25% Hourly Wages	50% Hourly Wages
15-1211	Computer Systems Analysts	\$44.44	\$52.63
15-1212	Information Security Analysts	\$40.57	\$60.26
15-1231	Computer Network Support Specialists	\$27.97	\$36.82
15-1241	Computer Network Architects	\$39.12	\$53.53
15-1244	Network and Computer Systems Administrators	\$37.80	\$47.52

SOURCE: LIGHTCAST 2026.1

Projected Supply

To project the supply of workers in this occupation for the Inland Empire/Desert region, this section analyzes past student award data, using the most recent data available for each dataset, for related programs combined with anticipated awards from proposed new programs. The CIP codes were chosen based on the CCCCCO TOP-CIP crosswalk.

Exhibit 13 displays student completions for any Computer Infrastructure and Support (TOP 0708.00) programs over the last three academic years (2022-2025). In the previous three academic years, 4 regional community colleges issued an average of 141 awards in relevant programs.

EXHIBIT 13.

Community College Program Awards, Inland Empire-Desert Region, AY 2022-2025

TOP	TOP6 Title	College	2022-23 Awards	2023-24 Awards	2024-25 Awards	3 Year Award Average
0708.00	Computer Infrastructure and Support	Chaffey	47	52	57	52
0708.00	Computer Infrastructure and Support	Crafton Hills	0	0	8	3
0708.00	Computer Infrastructure and Support	Moreno Valley	4	4	23	10
0708.00	Computer Infrastructure and Support	Riverside	28	94	106	76
Total			79	150	194	141

SOURCE: MIS DATAMART

Exhibit 14 displays student completions for any related non-community college programs over the last three academic years (2021-2024). In the previous three academic years, 1 regional non-community college institution issued an average of 4 awards in relevant programs.

EXHIBIT 14.

Non-Community College Program Awards, Inland Empire-Desert Region, AY 2021-2024

CIP	Title	Institution Name	2021-22 Awards	2022-23 Awards	2023-24 Awards	3 Year Award Average
11.0901	Computer Systems Networking and Telecommunications	DeVry University-California	2	4	7	4

No student completions were found for other related programs – Network and System Administration/Administrator (CIP 11.1001), Computer and Information Systems Security/Auditing/Information Assurance (CIP 11.1003), Computer and Information Systems Security/Auditing/Information Assurance (CIP 11.1003), Cloud Computing (CIP 11.0902), Computer Support Specialist (CIP 11.1006), System, Networking, and LAN/WAN Management/Manager (CIP 11.1002) – over the last three academic years (2021-2024).

To project the number of awards that may come from programs potentially offered in the region, we include the following assumptions:

1. College(s) would continue to confer awards based on the average annual baccalaureate degree awards amount as shown in Exhibit 13 and Exhibit 14.
2. The proposed program would be offered at a single community college within academic year 2027-2028.

Exhibit 15 displays the total projected supply with current average awards and a potential bachelor's degree program in TOP 0708.00 Computer Infrastructure and Support. In future years there are projected to be 185 awards across existing community college programs, existing non-community college programs, and a class of regional BA program graduates.

EXHIBIT 15.

CCC Award Data, Projected Total Awards, Inland Empire-Desert Region, 2027-2028

Program Code and Title	Program Type	Avg. Annual Awards
TOP 0708.00 Computer Infrastructure and Support	Existing CCC Programs	141
CIP 11.0901 Computer Systems Network and Communications	Existing Non-CCC Programs	4
	Projected BA Program	40
Total:		185

SOURCE: MIS DATAMART

Appendix: Methodology and Sources

Exhibit 13 displays the average annual California Community College (CCC) awards conferred during the three academic years between 2022 and 2025 from the California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. Awards are the combined total during the timeframe, divided by three in this case to calculate an annual average. This is being done to minimize the effect of atypical variations that might be present in a single year.

Type of Data	Source
Occupational Projections, Wages, and Job Postings	Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment. https://lightcast.io/ The job posting data is collected from scraping online job boards such as LinkedIn, Indeed, Glassdoor and many others. The process Lightcast uses to assemble this data does have some limitations due to methods that recruitment professionals sometimes use (e.g., posting one job to fill multiple positions). For example, the number of jobs posted is not necessarily the same as the number of job vacancies. While not perfect, Lightcast leverages machine learning and other AI technologies to enrich, deduplicate and aggregate this information to make it a meaningful dataset.
Self-Sufficiency Standard	Center for Women's Welfare, University of Washington. (2024). The self-sufficiency standard for California 2024. http://www.selfsufficiencystandard.org/. This calculation measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, childcare, health care, transportation, and taxes.
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm

Educational Supply

The CCCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: <https://datamart.cccco.edu>

The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions).

For more information, see <https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions>

IPUMS USA

Steven Ruggles, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. IPUMS USA: Version 15.0 [dataset]. Minneapolis, MN: IPUMS, 2024.

<https://doi.org/10.18128/D010.V15.0>. Available at [IPUMS USA](https://doi.org/10.18128/D010.V15.0)