










Computer Infrastructure and Support

Labor Market Analysis for San Diego College of Continuing Education

September 2021

Summary

| NEW PROGRAM RECOMMENDATION? | EVIDENCE OF A SUPPLY GAP? | AT OR ABOVE THE LIVING WAGE? | EXPECTED LEVEL OF EDUCATION |
|--|---|---|--|
|  <p>Proceed with New Program</p> |   |   | <input type="checkbox"/> Bachelor's Degree+ <input checked="" type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less than a HS Diploma <input type="checkbox"/> Apprenticeship |
| SUPPORT FOR PROGRAM MODIFICATION? | NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING | NUMBER OF ANNUAL JOB OPENINGS | |
|   | <p>MEDIUM</p>  | <p>LOW</p>  | |

This report provides labor market information for an occupation selected by San Diego College of Continuing Education for its *Computer Infrastructure and Support* program. The training provided by this program is likely to lead to employment as *Computer Network Support Specialists*. According to available labor market information, *Computer Network Support Specialists* in San Diego County have a labor market demand of 117 annual job openings (while average demand for a single occupation in San Diego County is 242 annual job openings). On average, three institutions supply 44 for-credit awards and one institution supplies 34 noncredit awards in San Diego County for this occupation. In short, the region supplies 78 for-credit and noncredit awards for 117 annual job openings, suggesting that there is a supply gap in the labor market. Entry-level and median wages are above the living wage for this occupation. This brief recommends proceeding with developing a new program or a program modification because 1) there is a supply gap; and 2) entry-level and median wages are above the living wage.

Introduction

This report provides labor market information in San Diego County for an occupation related to the six-digit Taxonomy of Programs (TOP)¹ code, Computer Infrastructure and Support (TOP 0708.00). The purpose of this brief is to assist noncredit program providers in the region, such as San Diego College of Continuing Education (SDCCE), with program development and review. SDCCE identified one occupation from the Standard Occupational Classification (SOC)² system for *Computer Infrastructure and Support*, which will be the focus of this report:

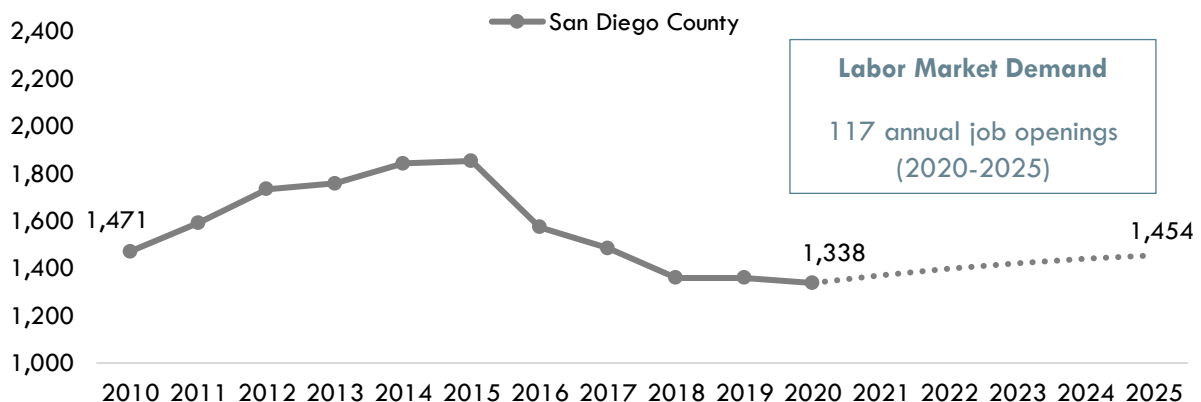
Computer Network Support Specialists (SOC 15-1231): Analyze, test, troubleshoot, and evaluate existing network systems, such as local area networks (LAN), wide area networks (WAN), cloud networks, servers, and other data communications networks. Perform network maintenance to ensure networks operate correctly with minimal interruption. Sample reported job titles include:

- Network Technician
- Technical Support Specialist
- Systems Support Specialist
- Network Engineer
- Network Analyst
- Systems Specialist
- Senior IT Assistant
- Personal Computer Network Analyst

Projected Occupational Demand

Between 2020 and 2025, *Computer Network Support Specialists* is projected to increase by 116 net jobs or nine percent (Exhibit 1). Employers in San Diego County will need to hire 117 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

Exhibit 1: Number of Jobs for Computer Network Support Specialists (2010-2025)³



¹ Taxonomy of Programs (TOP) is a system of codes used by the California Community Colleges for the purpose of collecting, calculating, or disseminating data about similar training programs.

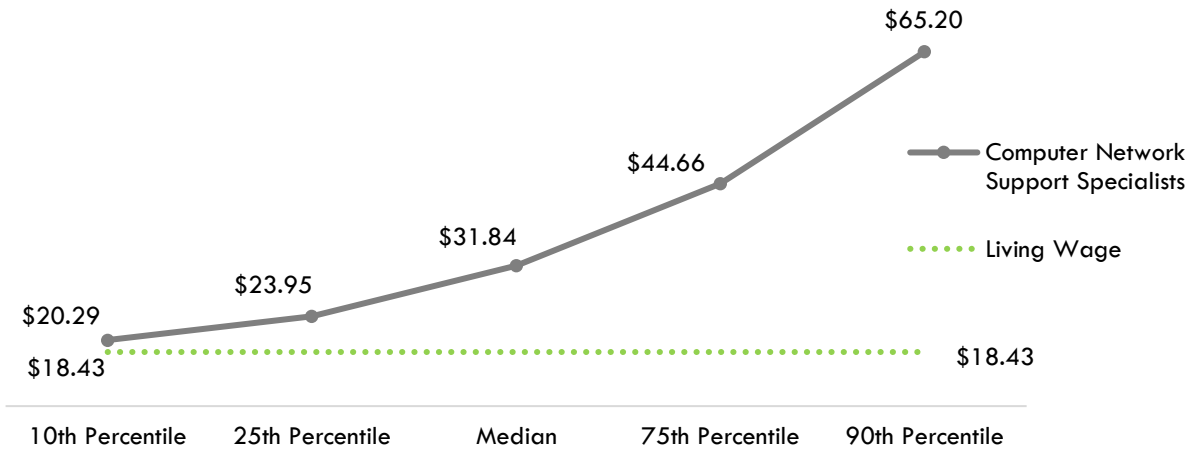
² The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc).

³ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

Earnings

Computer Network Support Specialists receive entry-level hourly earnings of \$23.95; this is more than the living wage for a single adult in San Diego County, which is \$18.43 per hour (Exhibit 2).⁴

Exhibit 2: Hourly Earnings⁵ for Computer Network Support Specialists in San Diego County⁶



Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.⁷ According to TOP and CIP⁸ data, three community colleges supply the region with for-credit awards for Computer Infrastructure and Support (TOP 0708.00): Grossmont College, MiraCosta College, and San Diego City College (Exhibit 3a).

⁴ "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightccd.org/family-needs-calculator/.

⁵ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

⁶ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

⁷ TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).

⁸ There are two CIP codes related to Computer Infrastructure and Support (TOP 0708.00): Network and System Administration/Administrator (CIP 11.1001) and Computer and Information Systems Security/Information Assurance (CIP 11.1003).

Exhibit 3a: Number of For-Credit Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Years 2017-18 through 2019-20)

| College | Award Type | PY 17-18 | PY 18-19 | PY 19-20 | 3-Yr Total Average |
|----------------|------------------------------|-----------|-----------|-----------|--------------------|
| Grossmont | Associate Degree | 0 | 0 | 3 | 1 |
| | Certificate 16 to < 30 units | 0 | 0 | 3 | 1 |
| | Total | 0 | 0 | 6 | 2 |
| MiraCosta | Associate Degree | 0 | 1 | 12 | 4 |
| | Certificate 30 to < 60 units | 0 | 0 | 7 | 2 |
| | Certificate 16 to < 30 units | 0 | 0 | 7 | 2 |
| | Certificate 6 to < 18 units | 0 | 2 | 4 | 2 |
| | Total | 0 | 3 | 30 | 11* |
| San Diego City | Associate Degree | 13 | 15 | 25 | 18 |
| | Certificate 30 to < 60 units | 0 | 0 | 1 | 0 |
| | Certificate 18 to < 30 units | 7 | 12 | 0 | 6 |
| | Certificate 16 to < 30 units | 0 | 0 | 5 | 2 |
| | Certificate 6 to < 18 units | 14 | 1 | 0 | 5 |
| | Total | 34 | 28 | 31 | 31 |
| Total | | 34 | 31 | 67 | 44 |

Note: The numbers may not add up exactly due to rounding.

By award type, the colleges supplied the most awards for **associate degrees** based on the three-year average (program years 2017-18 through 2019-20) (Exhibit 3b).

Exhibit 3b: Total Number of For-credit Awards by Type for Computer Infrastructure and Support (TOP 0708.00) in San Diego County (3-Yr Average)



In terms of noncredit awards, only San Diego College of Continuing Education provides noncredit awards for Computer Infrastructure and Support (TOP 0708.00), with a three-year average of 34 noncredit awards (program years 2017-18 through 2019-20) (Exhibit 4).

**Exhibit 4: Number of Noncredit Awards Conferred by SDCCE
(Program Years 2017-18 through 2019-20)**

| Program Title | Award Type | PY 17-18 | PY 18-19 | PY 19-20 | 3-Yr Total Average |
|-------------------------------|------------|----------|-----------|-----------|--------------------|
| Cloud Solutions AWS-Associate | Noncredit | 0 | 0 | 0 | 0 |
| Cyber Threat and Response | Noncredit | 0 | 17 | 11 | 9 |
| Cybersecurity Analyst | Noncredit | 0 | 13 | 44 | 19 |
| Security Essentials | Noncredit | 7 | 4 | 7 | 6 |
| Total | | 7 | 34 | 62 | 34 |

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply⁹ suggests that there is a **supply gap** in San Diego County, with 117 annual openings and 78 for-credit and noncredit awards supplied by the region (Exhibit 5).

Exhibit 5: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

| TOP6 Program | Demand (Annual Openings) | Supply (Total Annual Average Supply) | | Supply Gap or Oversupply |
|---|-----------------------------|---|------------|--------------------------------|
| | | Noncredit | For-Credit | |
| Computer Infrastructure and Support (TOP 0708.00) | 117 | 34 | 44 | 39 |

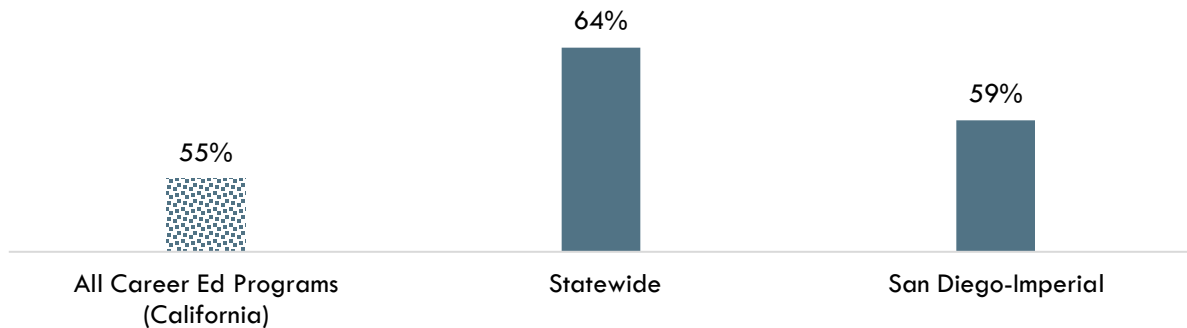
Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

⁹ Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

Student Outcomes and Regional Comparisons

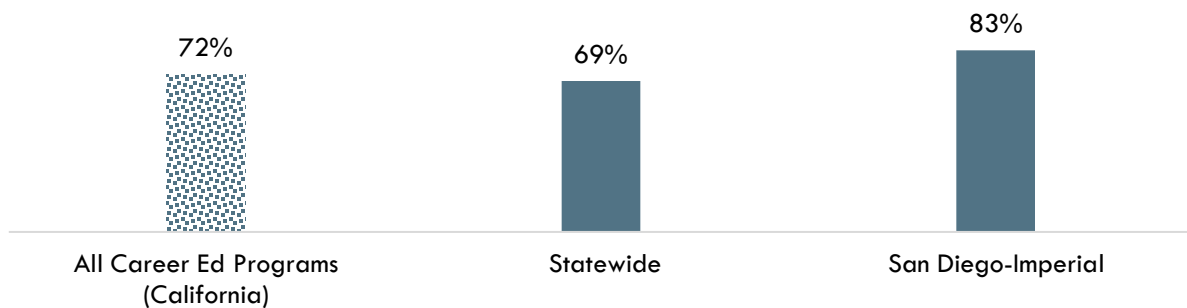
According to the California Community Colleges LaunchBoard, 59 percent of students in the San Diego-Imperial region earned a living wage after completing a Computer Infrastructure and Support (0708.00) program, compared to 64 percent statewide and 55 percent of students in Career Education programs in general across the state (Exhibit 6a).¹⁰

**Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program
(Computer Infrastructure and Support, PY 2017-18)¹¹**



According to the California Community Colleges LaunchBoard, 83 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a Computer Infrastructure and Support (0708.00) program, compared to 69 percent statewide and 72 percent of students in Career Education programs in general across the state (Exhibit 6b).¹²

**Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program
(Computer Infrastructure and Support, PY 2016-17)¹³**



¹⁰ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹¹ Among completers and skills builders who exited, the proportion of students who attained a living wage.

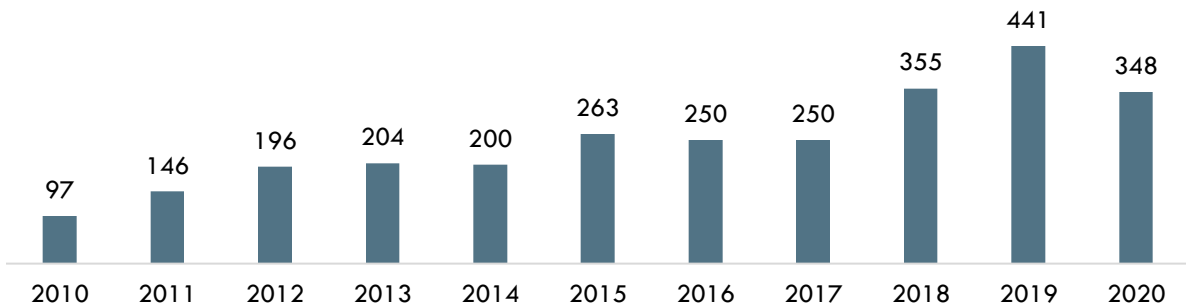
¹² "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹³ Most recent year with available data is Program Year 2016-17. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2010 and 2020, there was an average of 250 online job postings per year for *Computer Network Support Specialists* in San Diego County (Exhibit 7). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1). Employers may post a position multiple times for various reasons, such as increasing the pool of applicants, for example.

Exhibit 7: Number of Online Job Postings for Computer Network Support Specialists in San Diego County (2010-2020)¹⁴



Top Employers

Between January 1, 2018 and December 31, 2020, the top five employers in San Diego County for this occupation were *Northrop Grumman*, *Anthem Blue Cross*, *Qualcomm*, *U.S. Government*, and *Leidos* based on online job postings (Exhibit 8).

Exhibit 8: Top Employers for Computer Network Support Specialists in San Diego County¹⁵

| Top Employers | |
|--|--|
| <ul style="list-style-type: none"> • Northrop Grumman • Anthem Blue Cross • Qualcomm • U.S. Government • Leidos | <ul style="list-style-type: none"> • BAE Systems • Atlas Technologies • NCR Corporation • Cisco Systems Incorporated • Viasat |

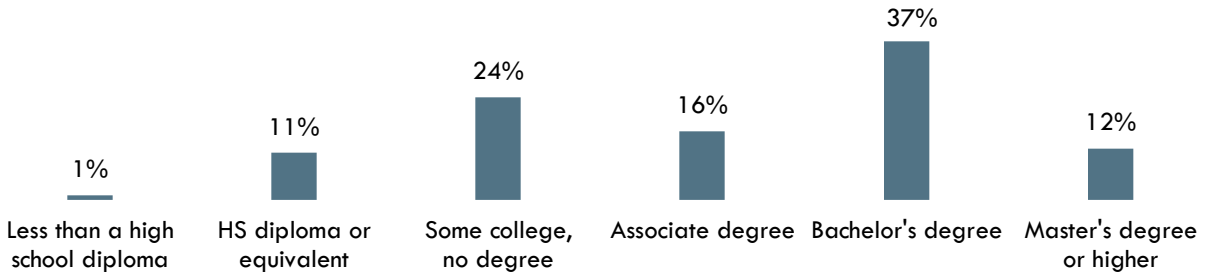
¹⁴ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2020.

¹⁵ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

Education, Skills, and Certifications

Exhibit 9 indicates the educational attainment for this occupation found currently in the national labor force. The typical entry-level education is an [associate degree](#).¹⁶

Exhibit 9: National Educational Attainment of Computer Network Support Specialists¹⁷



*may not total 100 percent due to rounding

¹⁶ EMSI 2021.2; QCEW, Non-QCEW, Self-Employed.

¹⁷ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified April 4, 2021. bls.gov/emp/tables/educational-attainment.htm.

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2018 and December 31, 2020.

Exhibit 10: Top Skills for Computer Network Support Specialists in San Diego County¹⁸

| Specialized Skills | Soft Skills | Software Skills |
|---|--|---|
| <ul style="list-style-type: none"> • Technical Support • System Administration • Customer Service • Repair • Hardware and Software Installation • Network Support • System/Network Configuration • Network Administration • Information Systems • VMware • Project Management • Hardware Troubleshooting • Network Troubleshooting • Wide Area Network • Routers | <ul style="list-style-type: none"> • Troubleshooting • Communication Skills • Problem Solving • Teamwork / Collaboration • Computer Literacy • Planning • Research • Detail-Oriented • Writing • Organizational Skills • Written Communication • Physical Abilities • Self-Starter • Multi-Tasking • Building Effective Relationships | <ul style="list-style-type: none"> • Linux • Microsoft Office • Microsoft Windows • Microsoft Excel • VMware • Windows Server • Python • SQL • UNIX • Microsoft Word • Microsoft Operating Systems • Bash • Systems Analysis • Oracle • Software Development |

¹⁸ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

Exhibit 11 lists the top certifications that appeared in online job postings between January 1, 2018 and December 31, 2020.

Exhibit 11: Top Certifications for Computer Network Support Specialists in San Diego County¹⁹

Top Certifications in Online Job Postings

1. Security Clearance
 2. CompTIA Security+
 3. Cisco Certified Network Associate (CCNA)
 4. Certified A+ Technician
 5. CompTIA Network+
 6. Certified Information Systems Security Professional (CISSP)
 7. Microsoft Certified Solutions Associate (MCSA)
 8. SANS/GIAC Certification
 9. IT Infrastructure Library (ITIL) Certification
 10. Systems Security Certified Practitioner (SSCP)
 11. GIAC Security Essentials Certification
 12. Microsoft Certified Solutions Expert (MCSE)
 13. CompTIA Linux+
 14. Cisco Certified Network Professional (CCNP)
 15. CompTIA Advanced Security Practitioner (CASP)
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¹⁹ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

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Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

This workforce demand report uses state and federal job projection data that was developed before the economic impact of COVID-19. The COE is monitoring the situation and will provide more information as it becomes available. Please consult with local employers to understand their current employment needs.