

March 2020

Labor Market Analysis

Computer Networking and Support

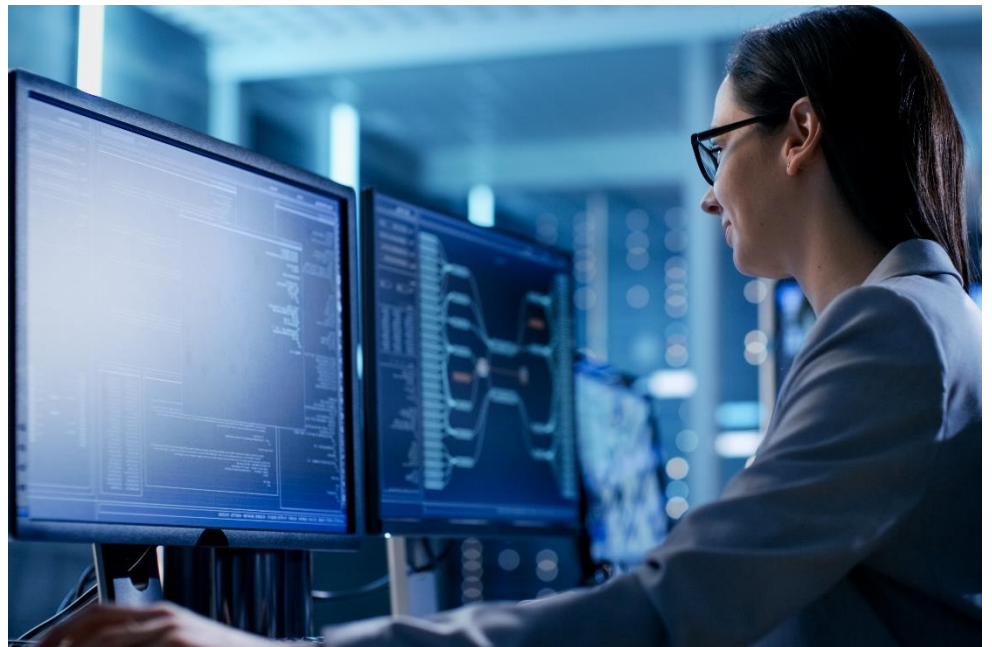


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Prepared by the Central Valley/Mother Lode Center of Excellence

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Summary

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for computer networking and support. Three occupations related to computer networking and support were identified for College of the Sequoias:

- 15-1151 Computer User Support Specialists
- 15-1199 Computer Occupations, All Other
- 15-1152 Computer Network Support Specialists

Key findings:

- **Occupational demand** — Nearly 4,400 workers were employed in jobs related to computer networking and support in 2018 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is computer user support specialists with 2,077 workers in 2018, a projected growth rate of 10% over the next five years, and 218 annual openings.
- **Wages** — Computer network support specialists have the highest earnings, a median wage of \$31.13/hour in the subregion and \$31.58/hour in the region.
- **Employers** — Employers with the most job postings in the subregion are Anthem Blue Cross, Northrop Grumman, and Lockheed Martin Corporation.
- **Job titles** — The most common occupational title in job postings in the subregion is computer user support specialist. The most common job title is information technology specialist.
- **Skills and certifications** — The top baseline skill is communication, the top specialized skill is customer service, and the top software skill is Microsoft Excel. The most in-demand certification is a driver's license.
- **Education** — Computer user support specialists typically have completed some college, but no degree, while computer network support specialists typically have an associate degree.
- **Supply** — Analysis of postsecondary completions in the region shows that on average 95 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 326 trained workers in the subregion and 590 workers in the region. The Center of Excellence recommends that College of the Sequoias work with the ICT/Digital Media Regional Director, the college's advisory board, and local industry in the expansion of programs to address the shortage of computer networking and support affiliated workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by College of the Sequoias to provide labor market information for computer networking and support. Review of the Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP) found the following programs are appropriate for this analysis:

- Computer Infrastructure and Support-070800
- Computer Networking-070810
- Computer Support-070820

The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the South Central Valley/Southern Mother Lode (SCV/SML) subregion is \$10.30/hour.¹ Analysis of the program and occupational data related to computer networking and support resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 15-1151 Computer User Support Specialists
- 15-1199 Computer Occupations, All Other
- 15-1152 Computer Network Support Specialists

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O*NET OnLine are shown below. O*NET data was not available for Computer Occupations, All Other.

Computer User Support Specialists

Job Description: Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, or via telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.

Sample Job Titles: Computer Specialist, Computer Support Specialist, Computer Technician, Desktop Support Technician, Help Desk Analyst, Help Desk Technician, Information Technology Specialist (IT Specialist), Network Technician, Support Specialist, Technical Support Specialist

Knowledge: Computers and Electronics, Customer and Personal Service, English Language, Telecommunications, Engineering and Technology

Skills: Active Listening, Reading Comprehension, Speaking, Complex Problem Solving, Critical Thinking

Computer Network Support Specialists

Job Description: Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption.

¹ The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Sample Job Titles: Computer Network Specialist, IT Consultant (Information Technology Consultant), Network Engineer, Network Specialist, Network Support Specialist, Network Technical Analyst, Network Technician, Personal Computer Network Analyst, Senior IT Assistant (Senior Information Technology Assistant), Systems Specialist

Knowledge: Computers and Electronics, Telecommunications, Customer and Personal Service, Engineering and Technology, English Language

Skills: Critical Thinking, Active Listening, Judgment and Decision Making, Reading Comprehension, Active Learning

Occupational Demand

The South Central Valley/Southern Mother Lode subregion employed 4,384 workers in computer networking and support occupations in 2018 (Exhibit 1). The largest occupation is computer user support specialists with 2,077 workers in 2018. This occupation is projected to grow by 10% over the next five years and has the greatest number of projected annual openings, 218.

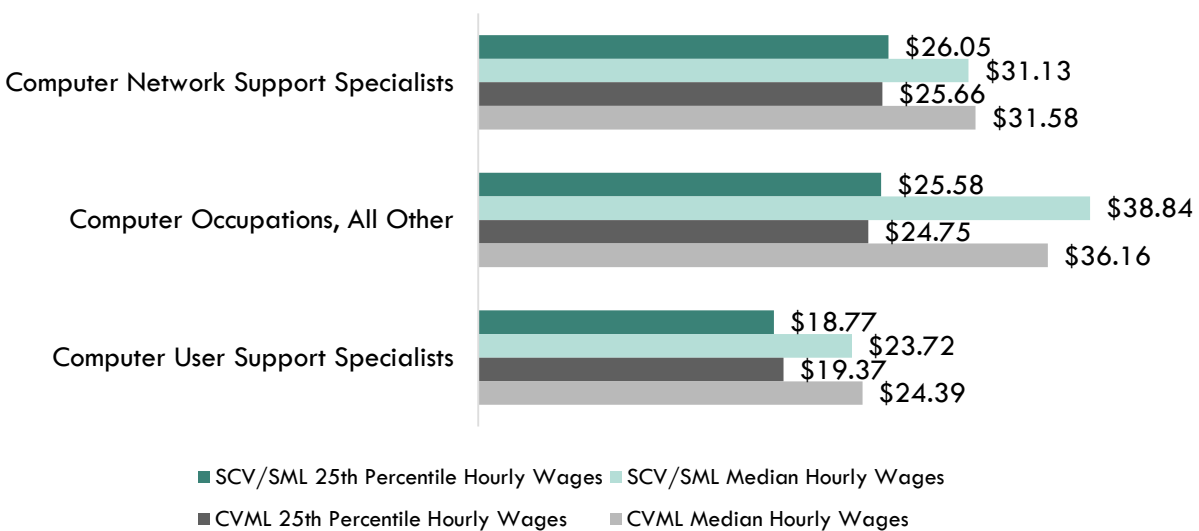
Exhibit 1. Computer networking and support employment and occupational projections in the SCV/SML subregion

Occupation	2018 Jobs	2023 Jobs	5-year Change	5-year % Change	Annual Openings
Computer User Support Specialists	2,077	2,276	199	10%	218
Computer Occupations, All Other	1,746	1,831	85	5%	148
Computer Network Support Specialists	561	601	40	7%	55
Total	4,384	4,707	323	7%	421

Wages

Exhibit 2 compares the entry-level and experienced wages of the computer networking and support occupations. Computer network support specialists have the highest earnings, a median wage of \$31.13/hour in the subregion and \$31.58/hour in the region.

Exhibit 2. Entry-level and experienced wage comparison in the SCV/SML subregion and region



Job Postings

There were 1,912 job postings for the three occupations in the SCV/SML subregion from September 2019 to February 2020. The employers with the most job postings are listed in Exhibit 3.

Exhibit 3. Top employers of computer networking and support occupations by number of job postings

Employer	Job Postings
Anthem Blue Cross	95
Northrop Grumman	29
Lockheed Martin Corporation	24
Patheon	24
The Save Mart Companies	20
US Government	20
Best Buy	18
Internal Revenue Service	18
American Consumer Panels	16
Jt4	16

Job posting analysis also included the top industries hiring positions related to computer networking and support (Exhibit 4).

Exhibit 4. Top industries for computer networking and support occupations by number of job postings

Industry	Job Postings
Employment Services	136
Insurance Carriers	131
Executive, Legislative, and Other General Government Support	62
Aerospace Product and Parts Manufacturing	61
Elementary and Secondary Schools	45
National Security and International Affairs	38
General Medical and Surgical Hospitals	37
Colleges, Universities, and Professional Schools	33
Pharmaceutical and Medicine Manufacturing	33
Architectural, Engineering, and Related Services	29

Job Titles

Exhibit 5 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across 10 O*NET OnLine occupations. The occupational title computer user support specialists is listed in the most job postings, 674, followed by information technology project managers, 280 job postings. Note that job postings are heavily dominated by the occupational title computer user support specialists.

Exhibit 5. Top occupational titles in job postings for computer networking and support occupations

Occupational Title	Job Postings
Computer User Support Specialists	674
Information Technology Project Managers	280
Computer Systems Engineers/Architects	252
Business Intelligence Analysts	210
Software Quality Assurance Engineers and Testers	134
Database Architects	97
Computer Network Support Specialists	84
Document Management Specialists	74
Data Warehousing Specialists	42
Computer Occupations, All Other	29

Analysis of the 1,912 advertised job titles reveals the top title is information technology specialist, occurring in 88 job postings, followed by systems engineer, 83 job postings (Exhibit 6).

Exhibit 6. Top job titles by number of job postings for computer networking and support occupations

Job Title	Job Postings
Information Technology Specialist	88
Systems Engineer	83
Data Analyst	70
Data Architect	52
Information Technology Technician	50
Field Service Technician	44
Computer Technician	34
Help Desk Technician	34
Information Technology Project Manager	32
PC Technician	31

Salaries

Exhibit 7 shows the “Market Salaries” for computer networking and support occupations that are calculated by Burning Glass which uses a machine learning model built off of millions of job postings every year, and accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 7. Salaries for computer networking and support occupations

Market Salary Percentile	Salary Amount
10th Percentile	34,040
25th Percentile	40,707
50th Percentile	63,267
75th Percentile	90,236
90th Percentile	114,738

Education

Of the 1,912 job postings, 1,146 listed an education level preferred for the positions being filled. Of those, 29% requested a high school diploma or vocational training, 13% requested an associate degree, and 72% requested a bachelor's degree (Exhibit 8).

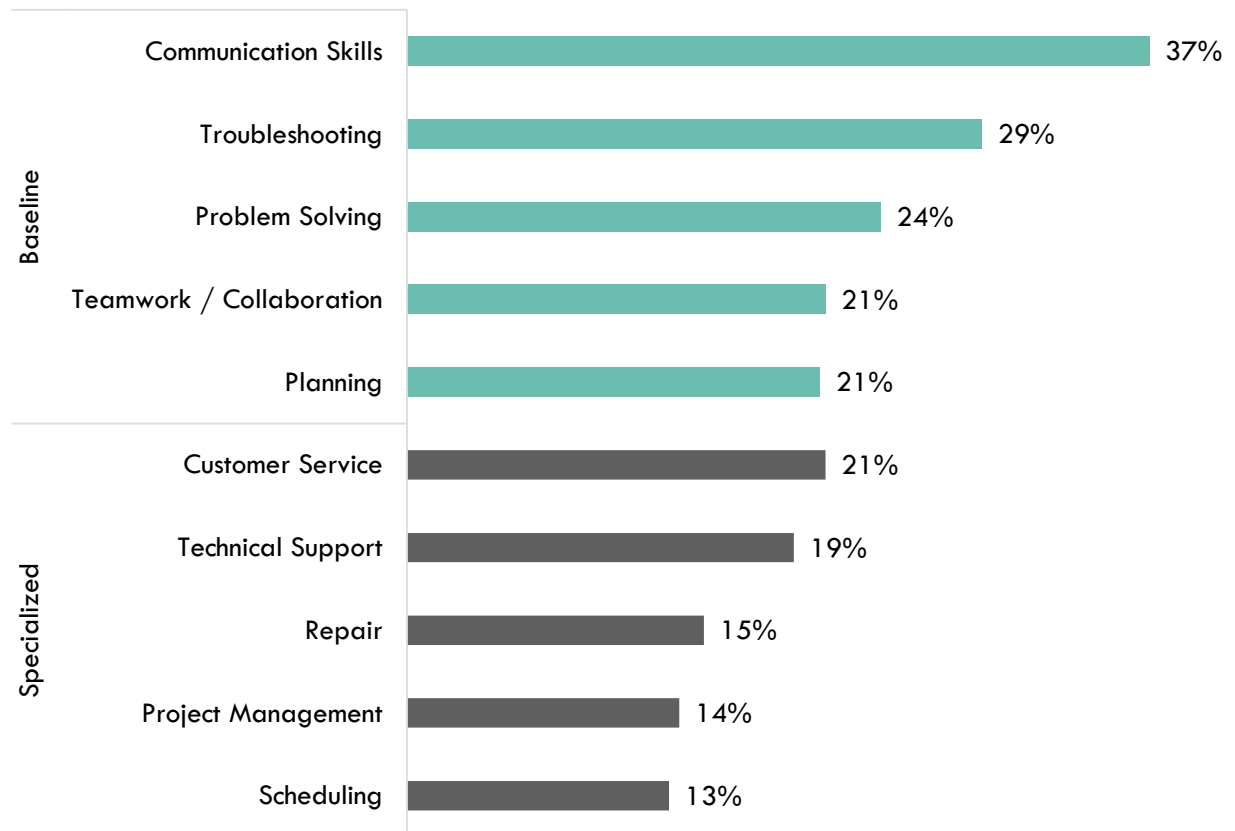
Exhibit 8. Education levels requested in job postings for computer networking and support occupations

Education level	% of Job Postings
Bachelor's degree	72%
High school or vocational training	29%
Master's degree	16%
Associate degree	13%
Doctoral degree	7%

Baseline and Specialized Skills

Exhibit 9 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication, 37% of job postings, troubleshooting, 29%, and problem solving, 24%. The top three specialized skills are customer service, 21% of job postings, technical support, 19%, and repair, 15%.

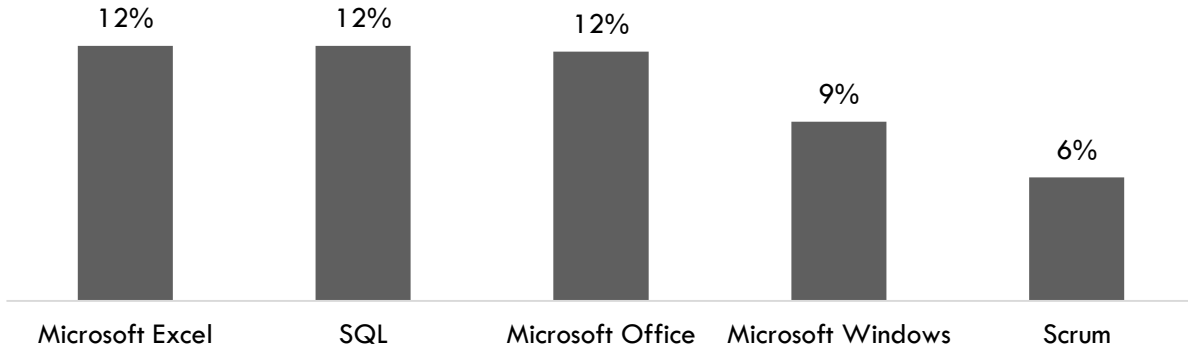
Exhibit 9. In-demand computer networking and support baseline and specialized skills



Software Skills

Analysis also included the software skills most in demand by employers. Microsoft Excel and SQL rank first and second (Exhibit 10).

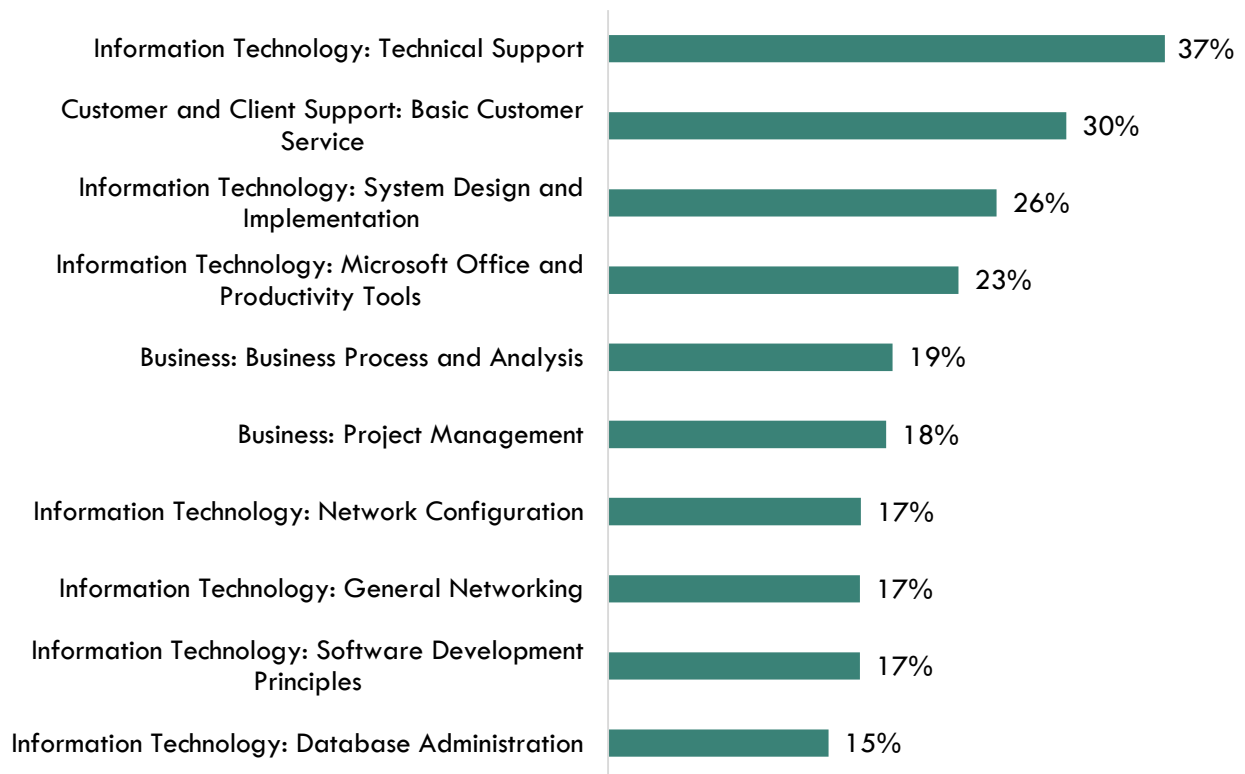
Exhibit 10. In-demand computer networking and support software skills



Skill Cluster Projections

Of the 1,912 job postings, 1,626 postings contained skill projections. An evaluation of the skill clusters that will have the greatest gains in level of importance shows that the top areas are Information Technology: Technical Support, 37%; Customer and Client Support: Basic Customer Service, 30%; and Information Technology: System Design and Implementation, 26% (Exhibit 11).

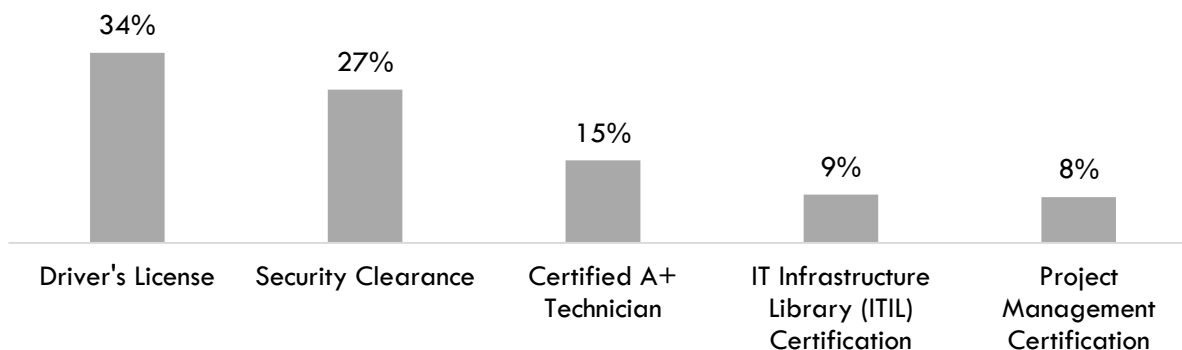
Exhibit 11. Skill cluster projections for computer networking and support



Certifications

Of the 1,912 job postings, 627 contained certification data. Of those, 34% indicated a need for a driver's license. The next top certifications are security clearance and Certified A+ Technician (Exhibit 12). (Due to the low number of job postings with certifications listed, the chart below may not be representative of the full sample.)

Exhibit 12. Top computer networking and support certifications requested in job postings



Education, Work Experience & Training

Computer user support specialists typically have completed some college, but no degree, while computer network support specialists typically have an associate degree (Exhibit 13). An occupation with a bachelor's degree as its typical entry-level education is considered middle-skill when one-third or more of current workers have completed some college up to an associate degree as their highest level of education. A bachelor's degree is typically required for computer occupations (all other), but nearly 35% of workers have completed some college up to an associate degree.

Exhibit 13. Education, work experience, training and Current Population Survey results for computer networking and support occupations²

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Computer User Support Specialists	Some college, no degree	None	None	41.2%
Computer Network Support Specialists	Associate degree	None	None	41.2%
Computer Occupations, All Other	Bachelor's degree	None	None	34.7%

Supply

Analysis of program data from the California Community Colleges Chancellor's Office Data Mart included the TOP and CIP codes: Computer Infrastructure and Support-070800, Computer Networking-070810, and Computer Support-070820. Analysis of the last three years of TOP code data shows that, on average, 95 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 14).

² "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

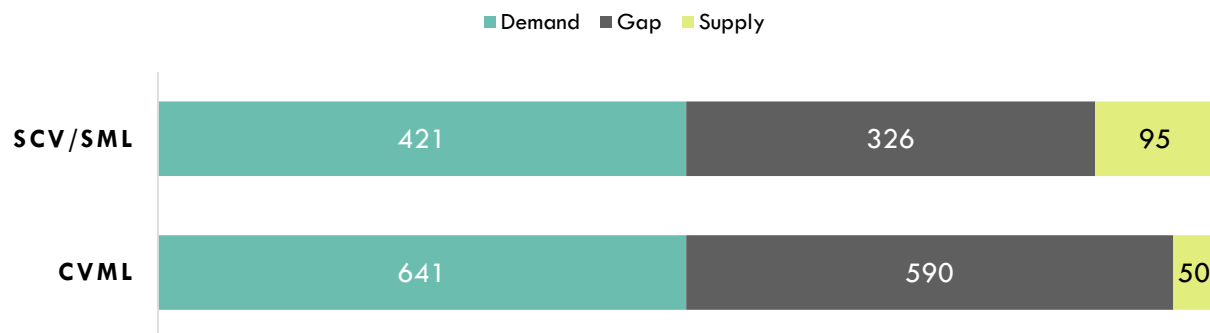
Exhibit 14. Postsecondary supply for computer networking and support occupations in the region

TOP Title-Code	College	Certificates	Degrees	Subtotal
Computer Infrastructure and Support-070800	Bakersfield	2		2
	Fresno City	3		3
	Sequoias	2		2
Computer Networking-070810	Cerro Coso	1	2	3
	Clovis Community	0	0	1
	Fresno City	10	14	23
	Modesto Junior	10		10
	Reedley College	4	4	8
	San Joaquin Delta	25	10	35
	Sequoias	1		1
	West Hills Lemoore	1		1
	Computer Support-070820	Clovis Community		0
Reedley College		4	2	6
Total		63	32	95

Gap Analysis

There is an undersupply of 326 computer networking and support workers in the SCV/SML subregion and 590 workers in the region (Exhibit 15).

Exhibit 15. Computer networking and support workforce annual demand and supply in the SCV/SML subregion and region



Student Outcomes

Exhibit 16 summarizes employment and wage outcomes from the California Community College Chancellor's Cal-PASS Plus LaunchBoard for the TOP codes related to computer networking. Across the region, the most students received a degree or certificate in computer networking. Of the students who completed a computer infrastructure and support program, 22% reported a median change in earnings, while 74% of computer networking and support students attained a living wage.

Exhibit 16. Regional metrics for the TOP codes related to computer networking

Metric	Computer Infrastructure and Support 070800	Computer Networking 070810	Computer Support 070820
Students Who Got a Degree or Certificate	13	76	11
Number of Students Who Transferred	12	*	*
Job Closely Related to Field of Study	60%	71%	*
Median Change in Earnings	22%	15%	(15%)
Attained a Living Wage	59%	74%	59%
* denotes data not available.			

Conclusion

The median wages of the three occupations exceed the SCV/SML subregion's average living wage. There were 1,912 job postings in the past six months for occupations related to computer networking and support in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication, and the top specialized skill is customer service.
- The top software skill is Microsoft Excel.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 326 in the SCV/SML subregion and 590 in the region.

Recommendation

Based on these findings, it is recommended that College of the Sequoias work with the ICT/Digital Media Regional Director, the college's advisory board, and local industry in the expansion or development of programs to address the shortage of computer networking and support affiliated workers in the region.

Appendix A: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor’s Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry: economicmodeling.com .
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org .

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.