



Computer Network Supervisors and Network Support Occupational Group

Inland Empire/Desert Region (Riverside-San Bernardino-Ontario Metropolitan Statistical Area)

Summary

- Employment for computer network supervisor and network support occupational group is expected to **increase by 10%** through 2021, **4,555 job openings** will be available over the five-year time frame.
- The entry-level hourly wage for each of the occupations, except the computer, automated teller, and office machine repairers, in the occupational group **exceeds the MIT Living Wage estimate of \$12.10 per hour** for a single adult living in the Inland Empire/Desert Region.
- Based on the average annual number of program completions between the selected TOP codes (**290 community college, 194 other educational institutions, 484 total**), and the annual openings for computer network supervisor and network support occupations in the local region (**911 job openings**), there appears to be an opportunity for program growth.

Job Opportunities

In 2016, there were nearly 9,900 computer network supervisor and network support occupational group jobs in the Inland Empire/Desert Region. Across the local region, employment related to this occupational group is expected to increase 10% through 2021. Employers in the Inland Empire/Desert Region will need to hire more than 4,550 workers over the next five years to fill new jobs and to backfill jobs that workers are leaving (includes retirements). Appendix A, Table 1 show the projected job growth for each of the occupations in this group.

Exhibit 1: Five-year projections for the computer network supervisor and network support occupational group in the Inland Empire/Desert Region

Region	2016 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Inland Empire/Desert Region	9,866	10%	4,555	911	15%

Source: EMSI 2017.3

Over the last 12 months (October 2016 to September 2017), there were 2,081 advertisements (ads) for jobs in the computer network supervisor and network support occupational group in the Inland Empire/Desert Region. In the full-year 2016 there were 2,283 job ads; 2,506 job ads in 2015; 1,916 job ads in 2014; and 1,491 job ads in 2013. Exhibit 2 shows the number of job ads posted during the last 12 months for each of the occupations in this group.

Exhibit 2: Job ads by each of the computer network supervisor and network support occupational group in the Inland Empire/Desert Region during the last 12 months, Oct 2016 – Sep 2017

Occupation	Job Ads
Computer User Support Specialists	836
Computer Systems Analysts	536
Network and Computer Systems Administrators	469
Information Security Analysts	175
Computer Network Support Specialists	51
Computer, Automated Teller, and Office Machine Repairers	14
TOTAL	2,081

Source: Burning Glass – Labor Insights

Earnings

The entry-level wage for each occupation, except computer, automated teller, and office machine repairers, is above the MIT Living Wage estimate of \$12.10 per hour for a single adult living in the



Inland Empire/Desert Region. See Exhibit 3 for wage information by occupation for the Inland Empire/Desert Region.

Exhibit 3: Earnings for computer network supervisor and network support occupational group in the Inland Empire/Desert Region

Occupation	Entry to Experienced Hourly Earnings Range*	Median Wage*	Avg. Annual Earnings
Computer Systems Analysts	\$25.65 to \$50.38	\$36.41	\$77,100
Information Security Analysts	\$23.90 to \$63.16	\$48.42	\$96,800
Network and Computer Systems Administrators	\$23.89 to \$50.25	\$33.75	\$73,200
Computer Network Support Specialists	\$20.09 to \$53.88	\$30.80	\$71,000
Computer User Support Specialists	\$15.50 to \$36.33	\$24.70	\$52,100
Computer, Automated Teller, and Office Machine Repairers	\$12.00 to \$21.56	\$16.86	\$35,300

Source: EMSI 2017.3

*Entry Hourly is 10th percentile wage, median is 50th percentile wage, experienced is 90th percentile wage.

Work Locations, Skills, and Education

According to job ads, the top worksite regional cities for jobs in this occupational group were Ontario, Riverside, San Bernardino, Corona, and Rancho Cucamonga. The top employers posting job ads were Best Buy, San Manuel Indian Bingo & Casino, Obsidian Solutions Group, and Niagara Bottling Llc. Exhibit 4 lists the top specialized, soft, and software and programming skills that employers are seeking when looking for workers to fill these positions. “N/A” indicates that data are not available due to the low number of job postings for that occupation.

Exhibit 4: Top skills in greatest demand for the computer network supervisor and network support occupational group in the Inland Empire/Desert Region, Oct 2016-Sep 2017

Occupation	Specialized skills	Soft skills	Software and Programming skills
Computer User Support Specialists	<ul style="list-style-type: none"> • Technical Support • Help Desk Support • Repair 	<ul style="list-style-type: none"> • Troubleshooting • Communication Skills • Writing 	<ul style="list-style-type: none"> • Microsoft Office • Microsoft Windows • LINUX
Computer Systems Analysts	<ul style="list-style-type: none"> • SQL • Microsoft Excel • Project Management 	<ul style="list-style-type: none"> • Communication Skills • Troubleshooting • Writing 	<ul style="list-style-type: none"> • Microsoft Excel • SQL • Microsoft Office • Oracle
Network and Computer Systems Administrators	<ul style="list-style-type: none"> • Technical Support • Routers • VMware 	<ul style="list-style-type: none"> • Troubleshooting • Problem Solving • Communication Skills 	<ul style="list-style-type: none"> • VMware • Microsoft Office • Windows Server • SQL
Information Security Analysts	<ul style="list-style-type: none"> • Network Security • LINUX • Information Systems 	<ul style="list-style-type: none"> • Communication Skills • Writing • Planning 	<ul style="list-style-type: none"> • LINUX • Microsoft Office • SQL • Python
Computer Network Support Specialists	<ul style="list-style-type: none"> • Technical Support • Network Administration • Information Systems 	<ul style="list-style-type: none"> • Troubleshooting • Communication Skills • Planning 	<ul style="list-style-type: none"> • Microsoft Office • Microsoft Operating Systems • VMware
Computer, Automated Teller, and Office Machine Repairers	<ul style="list-style-type: none"> • Repair • Technical Assistance • Transformers 	<ul style="list-style-type: none"> • Physical Demand • English • Troubleshooting 	<ul style="list-style-type: none"> • N/A

Source: Burning Glass – Labor Insights

Exhibit 5 displays the entry-level education level education typically required to enter each occupation according to the Bureau of Labor Statistics, educational attainment for incumbent workers with “some college, no degree” and an “associate degree” according to the U.S. Census, and the minimum advertised education requirement requested by employers in online job ads.

Exhibit 5: Educational attainment and online job ads with minimum advertised education requirements for the computer network supervisor and network support occupational group in the Inland Empire/Desert Region, Oct 2016-Sep 2017

Occupations	Typical Entry-Level Education Requirement	Educational Attainment (Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework)	Minimum Advertised Education Requirement from Job Ads		
			High school diploma or vocational training	Associate degree	Bachelor’s degree or higher
Computer User Support Specialists	Some college, no degree	43%	64%	14%	22%
Computer Systems Analysts	Bachelor’s degree	22%	29%	7%	64%
Network and Computer Systems Administrators	Bachelor’s degree	39%	18%	10%	72%
Information Security Analysts	Bachelor’s degree	25%	17%	14%	69%
Computer Network Support Specialists	Associate degree	43%	29%	50%	21%
Computer, Automated Teller, and Office Machine Repairers	Some college, no degree	52%	75%	25%	-

Source: EMSI 2017.3, Current Population Survey, Burning Glass – Labor Insights

Industry

Exhibit 6 displays the industries that employ the most computer network supervisor and network support occupations in the two-county region. Staffing patterns show the industries employ the most of a specific occupation.

Exhibit 6: Top Industries employing each computer network supervisor and network support occupation in the Inland Empire/Desert Region

Occupation	Top Industries Staffing Pattern (NAICS)	Top Industries Job Ads (NAICS)
Computer User Support Specialists	<ul style="list-style-type: none"> Education and Hospitals (Local Government) (9036) Computer Systems Design and Related Services (5415) 	<ul style="list-style-type: none"> Electronics and Appliance Stores (4431)
Computer Systems Analysts	<ul style="list-style-type: none"> Computer Systems Design and Related Services (5415) Local Government, Excluding Education and Hospitals (9039) 	<ul style="list-style-type: none"> Colleges, Universities, and Professional Schools (6113)
Network and Computer Systems Administrators	<ul style="list-style-type: none"> Education and Hospitals (Local Government) (9036) Computer Systems Design and Related Services (5415) 	<ul style="list-style-type: none"> Gambling Industries (7132)
Information Security Analysts	<ul style="list-style-type: none"> Computer Systems Design and Related Services (5415) Employment Services (5613) 	<ul style="list-style-type: none"> Colleges, Universities, and Professional Schools (6113) Executive, Legislative, and Other General Government Support (9211)
Computer Network Support Specialists	<ul style="list-style-type: none"> Education and Hospitals (Local Government) (9036) Computer Systems Design and Related Services (5415) 	<ul style="list-style-type: none"> Other Miscellaneous Store Retailers (4539)

Occupation	Top Industries Staffing Pattern (NAICS)	Top Industries Job Ads (NAICS)
Computer, Automated Teller, and Office Machine Repairers	<ul style="list-style-type: none"> Electronic and Precision Equipment Repair and Maintenance (8112) Professional and Commercial Equipment and Supplies Merchant Wholesalers (4234) 	<ul style="list-style-type: none"> National Security and International Affairs (9281) Commercial and Service Industry Machinery Manufacturing (9281)

Source: EMSI 2017.3, Burning Glass – Labor Insights

Student Completions

Exhibits 7, 8, and 9 show the annual average regional community college awards (associate degrees and certificates) conferred during the three academic years between 2013 and 2016, as well as other awards granted outside the California Community College system from 2012-2015, with the relevant TOP code. Please note, an award is not equivalent to a single person in search of a job opening since a student may earn more than one award, such as an associate degree in addition to a certificate.

Community College student outcome information was obtained from the CTE LaunchBoard based on the selected TOP code(s) and region:

Exhibit 7: Annual average community college student completions for the computer information systems program in the Inland Empire/Desert Region

0702.00 – Computer Information Systems	Annual Avg. CC Headcount (2015-16)	CC Annual Avg. Awards (2013-16)	Other Educational Institutions Annual Avg. Certificates or Other Credit Awards (2012-15)
Westwood College-Inland Empire			
Associate Degree			5
Barstow	387		
Associate Degree		5	
Certificate 18 to < 30 semester units		1*	
Chaffey	1,829		
Associate Degree		18	
Certificate 30 to < 60 semester units		6	
Copper Mountain			
Associate Degree		5	
Crafton Hills			
Associate Degree		6	
Certificate 18 to < 30 semester units		1*	
Certificate 6 to < 18 semester units		7	
Desert	1,033		
Associate Degree		3	
Certificate 30 to < 60 semester units		2	
Mt. San Jacinto	770		
Associate Degree		24	
Certificate 30 to < 60 semester units		2	
San Bernardino	126		
Associate Degree		3	
Certificate 18 to < 30 semester units		2	
Palo Verde			
Associate Degree		1	
Certificate 6 to < 18 semester units		48	
Victor Valley	23		
Associate Degree		12	
Moreno Valley	623		
Norco	616		
Riverside	1,444		
Total CC Headcount (2015-16)	6,830		
Total annual average community college awards		144	
Total annual average other awards			5

Source: LaunchBoard, IPEDS

*Barstow awarded one certificate in 2013-14, Crafton Hill awarded one certificate 18 to < 30 semester units in 2015-16

0702.00 – Computer Information Systems program outcomes in the Inland Empire/Desert Region in academic year 2014-15:

- The median annual earnings is \$18,168 (California median = \$20,240).
- 40% of students are earning a living wage (50%).
- Median change in earnings was 36% (33%).
- 63% of students are employed within six months after completing a program (64%).

Exhibit 8: Annual average community college student completions for the computer infrastructure and support program in the Inland Empire/Desert Region

0708.00 – Computer Infrastructure and Support	Annual Avg. CC Headcount (2015-16)	CC Annual Avg. Awards (2013-16)	Other Educational Institutions Annual Avg. Certificates or Other Credit Awards (2012-15)
Mayfield College			
Award < 1 academic yr			17
Computer Training Academy			
Award < 1 academic yr			31
Chaffey	135		
Mt. San Jacinto	39		
San Bernardino	26		
Total CC Headcount (2015-16)	200		
Total annual average community college awards		0	
Total annual average other awards			49

Source: LaunchBoard, IPEDS

*Copper Mountain awarded 1 certificate in 2015-16

0708.00 – Computer Infrastructure and Support program outcomes in the Inland Empire/Desert Region in academic year 2014-15:

- The median annual earnings is \$37,350 (California median = \$37,238).
- 48% of students are earning a living wage (63%).
- Median change in earnings was 29% (29%).
- 74% of students are employed within six months after completing a program (67%).

Exhibit 7: Annual average community college student completions for the computer networking program in the Inland Empire/Desert Region

0708.10 – Computer Networking	Annual Avg. CC Headcount (2015-16)	CC Annual Avg. Awards (2013-16)	Other Educational Institutions Annual Avg. Certificates or Other Credit Awards (2012-15)
ITT Technical Institute-San Bernardino			
Associate Degree			64
University of Redlands			
Award 1 < 2 academic yrs			3
Westwood College-Inland Empire			
Associate Degree			2
ITT Technical Institute-Corona			
Associate Degree			71
Chaffey	152		
Certificate 30 to < 60 semester units		60	
Certificate 18 to < 30 semester units		75	
Certificate 6 to < 18 semester units		1	
Mt. San Jacinto	81		
Certificate 30 to < 60 semester units		2	
Riverside	109		
Certificate 6 to < 18 semester units		7	
San Bernardino	19		
Victor Valley	32		
Total CC Headcount (2015-16)	393		
Total annual average community college awards		146	
Total annual average other awards			140

Source: LaunchBoard, IPEDS

*Copper Mountain awarded 1 certificate in 2015-16

0708.10 – Computer Networking program outcomes in the Inland Empire/Desert Region in academic year 2014-15:

- The median annual earnings is \$39,498 (California median = \$40,456).
- 62% of students are earning a living wage (65%).
- Median change in earnings was 15% (29%).
- 74% of students are employed within six months after completing a program (71%).



Sources

O*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

Employment Development Department, Labor Market Information Division, OES

Employment Development Department, Unemployment Insurance Dataset

CTE LaunchBoard

Statewide CTE Outcomes Survey

Living Insight Center for Community Economic Development

California Community Colleges Chancellor's Office Management Information Systems (MIS)

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Appendix A: Occupation definitions, five-year projections, and earnings for computer network supervisor and network support occupations

Occupation Definitions (SOC code), Education and Training Requirement, Community College Education Attainment

Computer Systems Analysts (15-1121)

Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software.

Sample job titles: Applications Analyst, Business Analyst, Business Systems Analyst, Computer Analyst, Computer Systems Analyst, Computer Systems Consultant, Information Systems Analyst (ISA), Information Technology Analyst (IT Analyst), System Analyst, Systems Analyst

Entry-Level Educational Requirement: Bachelor's degree

Training Requirement: None

Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 22%

Information Security Analysts (15-1122)

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.

Sample job titles: 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

Entry-Level Educational Requirement: Bachelor's degree

Training Requirement: None

Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 25%



Network and Computer Systems Administrators (15-1142)

Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Monitor network to ensure network availability to all system users and may perform necessary maintenance to support network availability. May monitor and test Web site performance to ensure Web sites operate correctly and without interruption. May assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software. May supervise computer user support specialists and computer network support specialists. May administer network security measures.

Sample of job titles: Information Analyst, Information Systems Manager (IS Manager), Information Technology Specialist (IT Specialist), LAN Specialist (Local Area Network Specialist), Local Area Network Administrator (LAN Administrator), Network Administrator, Network Coordinator, Network Manager, Network Specialist, Systems Administrator

Entry-Level Educational Requirement: Bachelor's degree

Training Requirement: None

Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 39%

Computer User Support Specialists (15-1151)

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

Entry-Level Educational Requirement: Some college, no degree

Training Requirement: None

Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 43%

Computer Network Support Specialists (15-1152)

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.

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

Entry-Level Educational Requirement: Associate degree

Training Requirement: None

Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 43%

Computer, Automated Teller, and Office Machine Repairers (49-2011)

Repair, maintain, or install computers, word processing systems, automated teller machines, and electronic office machines, such as duplicating and fax machines.

Sample of reported job titles: ATM Technician (Automated Teller Machine Technician), Computer Repair Technician, Computer Technician, Copier Technician, Customer Service Engineer, Field Engineer, Field Service Engineer, Field Service Technician, Field Technician, Service Technician

Entry-Level Educational Requirement: Some college, no degree

Training Requirement: Less than one month on-the-job training

Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 52%



Table 1. 2016 to 2021 job growth for the computer network supervisor and network support occupational group, Inland Empire/Desert Region

Occupation (SOC)	2016 Jobs	2021 Jobs	5-Yr Change	5-Yr % Change	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)
Computer User Support Specialists (15-1151)	3,883	4,266	383	10%	1,784	357
Computer Systems Analysts 15-1121)	2,042	2,307	265	13%	939	188
Network and Computer Systems Administrators (15-1142)	1,721	1,897	176	10%	722	144
Computer, Automated Teller, and Office Machine Repairers (49-2011)	1,109	1,124	15	1%	576	115
Computer Network Support Specialists (15-1152)	971	1,074	103	11%	454	91
Information Security Analysts (15-1122)	139	170	31	22%	78	16
Total	9,866	10,839	973	10%	4,555	911

Source: EMSI 2017.3