**Computer Networking Occupations**

**Labor Market Information Report**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

April 2018

# Recommendation

Based on all available data, there appears to be a large undersupply of Computer Networking workers in the Bay region and East Bay sub-region (Alameda and Contra Costa Counties). The labor market gap is 5,660 in the Bay region and 950 in the East Bay sub-region. Bachelor’s degrees and post baccalaureate certificates are included in the supply numbers since the occupational cluster selected typically requires a Bachelor’s degree for entry.

This report also provides student outcomes data on employment and earnings for Computer Networking programs (TOP 0708.10) in the sub-region, region and state. Outcomes data is also provided for Computer Infrastructure and Support (TOP 0708.00) since students at Las Positas College are taking courses on this TOP code for the awards issued on 0708.10 (where there are no students taking courses at Las Positas in 2016-17). It is recommended that this data be reviewed to better understand how outcomes for students at Las Positas taking courses on these two TOP codes compare to potentially similar programs at colleges in the sub-region, region and state, as well as to outcomes across all CTE programs at Las Positas College and in the region.

# Introduction

This report profiles Computer Networking Occupations in the 12 county Bay region and the East Bay sub-region (Alameda and Contra Costa counties) for review of an existing program at Las Positas College.

* **Computer Systems Analysts (SOC 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.

*Entry-Level Educational Requirement:* *Bachelor’s Degree*

*Training Requirement:* *None*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 21%

* **Information Security Analysts (SOC 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.

*Entry-Level Educational Requirement:* *Bachelor’s Degree*

*Training Requirement:* *None*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 27%

* **Computer Network Architects (SOC 15-1143):** Design and implement computer and information networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. Perform network modeling, analysis, and planning. May also design network and computer security measures. May research and recommend network and data communications hardware and software.

*Entry-Level Educational Requirement:* *Bachelor’s Degree*

*Training Requirement:* *None*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 35%

* **Computer Network Support Specialists (SOC 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.

*Entry-Level Educational Requirement:* *Associate Degree*

*Training Requirement:* *None*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 41%

# Occupational Demand

**Table 1. Employment Outlook for Computer Networking Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Openings | Annual Openings | 10% Hourly Wage | Median Hourly Wage |
| Computer Systems Analysts | 36,911 | 43,701 | 6,790  | 18% | 19,467 | 3,893 | $32.15  | $52.01  |
| Information Security Analysts | 3,790 | 4,629 | 838  | 22% | 2,219 | 444 | $29.68  | $55.54  |
| Computer Network Architects | 8,549 | 9,750 | 1,201  | 14% | 4,101 | 820 | $34.95  | $64.10  |
| Computer Network Support Specialists | 8,325 | 9,539 | 1,213  | 15% | 4,426 | 885 | $23.72  | $38.39  |
| **Total** | **57,576** | **67,619** | **10,043** | **17%** | **30,213** | **6,043** | **$31.18**  | **$52.07**  |

*Source: EMSI 2018.2*

**Bay Region** includes Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties

**Table 2. Employment Outlook for Computer Networking Occupations in East Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Openings | Annual Openings | 10% Hourly Wage | Median Hourly Wage |
| Computer Systems Analysts | 6,795 | 7,788 | 994  | 15% | 3,284 | 657 | $27.92  | $44.58  |
| Information Security Analysts | 557 | 672 | 115  | 21% | 316 | 63 | $37.36  | $55.98  |
| Computer Network Architects | 1,727 | 1,892 | 165  | 10% | 740 | 148 | $33.09  | $60.21  |
| Computer Network Support Specialists | 1,828 | 2,030 | 201  | 11% | 895 | 179 | $22.99  | $36.79  |
| **Total** | **10,907** | **12,382** | **1,475**  | **14%** | **5,235** | **1,047** | **$28.40**  | **$46.33**  |

*Source: EMSI 2018.2*

**East Bay Sub-Region** includes Alameda and Contra Costa counties

### Job Postings in Bay Region and East Bay Sub-Region

**Table 3. Number of Job Postings for Computer Networking Occupations (April 2017 – March 2018)**

|  |  |  |
| --- | --- | --- |
| Occupation | Bay Region | East Bay |
| Computer Systems Analysts (15-1121.00) | 9,224 | 1,698 |
| Information Security Analysts (15-1122.00) | 5,608 | 808 |
| Computer Network Architects (15-1143.00) | 3,851 | 662 |
| Computer Network Support Specialists (15-1152.00) | 695 | 142 |
| Telecommunications Engineering Specialists (15-1143.01) | 445 | 112 |
| Informatics Nurse Specialists (15-1121.01) | 29 | 5 |
| **Total** | **19,852** | **3,427** |

*Source: Burning Glass*

**Table 4. Top Job Titles for Computer Networking Occupations for latest 12 months (April 2017 – March 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Common Title | Bay | East Bay | Common Title | Bay | East Bay |
| Network Engineer | 1,737 | 294 | Technical Analyst | 192 | 51 |
| Business Systems Analyst | 1,607 | 451 | Senior Architect | 175 | 16 |
| Security Engineer | 1,254 | 94 | Business Analyst | 157 | 17 |
| Systems Analyst | 611 | 139 | Information Security Manager | 155 | 23 |
| Developer | 518 | 77 | Information Technology Business Analyst | 148 | 43 |
| Security Architect | 360 | 47 | Oracle Consultant | 139 | 11 |
| Technical Consultant | 330 | 21 | Security Consultant | 135 | 29 |
| Security Analyst | 323 | 66 | Wireless Engineer | 119 | 6 |
| Software Development Engineer | 298 | 33 | Information Technology Security Analyst | 115 | 23 |
| Information Security Engineer | 288 | 54 | Aem Developer | 100 | 24 |
| Information Security Analyst | 237 | 55 | Information Technology Auditor | 99 | 26 |
| Network Security Engineer | 222 | 36 | Information Technology Consultant | 92 | 29 |
| Security Manager | 216 | 27 | Team Lead | 92 | 21 |
| Network Architect | 211 | 86 | Cyber Security Engineer | 88 | 26 |
| Information Technology Analyst | 201 | 28 | Oracle Functional Consultant | 88 | 5 |
| Systems Engineer | 200 | 45 | Implementation Consultant | 78 | 6 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Computer Networking Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Industry – 6 Digit NAICS (No. American Industry Classification) Codes** | **Jobs in Industry (2017)** | **Jobs in Industry (2022)** | **% Change (2017-22)** | **% in Industry (2017)** |
| Custom Computer Programming Services (541511) | 12,909 | 15,774 | 22% | 22.4% |
| Computer Systems Design Services (541512) | 8,306 | 10,206 | 23% | 14.4% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 2,981 | 3,852 | 29% | 5.2% |
| Data Processing, Hosting, and Related Services (518210) | 2,857 | 3,990 | 40% | 5.0% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 2,773 | 2,900 | 5% | 4.8% |
| Electronic Computer Manufacturing (334111) | 2,509 | 2,785 | 11% | 4.4% |
| Software Publishers (511210) | 1,965 | 2,422 | 23% | 3.4% |
| Other Computer Related Services (541519) | 1,812 | 2,413 | 33% | 3.1% |
| Local Government, Excluding Education and Hospitals (903999) | 1,073 | 1,140 | 6% | 1.9% |
| R&D in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotech) (541715) | 892 | 957 | 7% | 1.5% |
| Temporary Help Services (561320) | 858 | 982 | 14% | 1.5% |
| Wired Telecommunications Carriers (517311) | 784 | 767 |  (2%) | 1.4% |
| General Medical and Surgical Hospitals (622110) | 675 | 688 | 2% | 1.2% |
| Computer and Computer Peripheral Equipment and Software Merchant Wholesalers (423430) | 660 | 683 | 3% | 1.1% |
| Colleges, Universities & Professional Schools (State Government) (902612) | 656 | 692 | 5% | 1.1% |
| Admin. Management & General Management Consulting Services (541611) | 561 | 710 | 27% | 1.0% |
| Colleges, Universities, and Professional Schools (611310) | 557 | 623 | 12% | 1.0% |

*Source: EMSI 2018.2*

**Table 6. Top Employers Posting Jobs for Computer Networking Occupations (April 2017 – March 2018)**

Note: In the East Bay, 44% of records have been excluded because they do not include an employer. As a result, the chart below may not be representative of the full sample in the East Bay.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employer** | **Bay** | **Employer** | **Bay** | **Employer** | **East Bay** |
| Apple Inc. | 389 | Matchpoint Solutions Inc | 71 | Workday, Inc | 95 |
| Oracle | 311 | Autodesk Inc | 67 | Accenture | 73 |
| Wells Fargo | 302 | Okaya Infocom | 65 | Wells Fargo | 68 |
| Accenture | 258 | SAP | 64 | Oracle | 62 |
| Cisco Systems Inc | 195 | Intel Corporation | 59 | Kaiser Permanente | 48 |
| Google Inc. | 183 | Servicenow | 58 | Tesla Motors | 33 |
| Deloitte | 178 | Codeforce 360 | 57 | General Electric Company | 31 |
| Salesforce | 178 | Gap Inc. | 57 | Bank of the West | 29 |
| Facebook | 139 | Aramark | 56 | Ellie Mae | 29 |
| Workday, Inc | 126 | Linkedin Limited | 56 | Uc San Diego | 25 |
| Nvidia Corporation | 87 | Uber | 56 | Lawrence Livermore National Lab | 23 |
| Republic Bancorp | 82 | Tesla Motors | 54 | Talbridge Limited | 23 |
| Palo Alto Networks | 77 | Kaiser Permanente | 53 | University California | 21 |
| Visa | 73 | Verizon Communications Inc | 51 | Safeway Incorporated | 19 |
| Xoriant Inc | 72 | Lockheed Martin Corporation | 49 | Ross Stores | 17 |

*Source: Burning Glass*

# Educational Supply

Note: At Las Positas College, there are awards issued on 0708.10 - Computer Networking; however, students are taking courses on Computer Infrastructure and Support (TOP 0708.00) for the awards issued on 0708.10 (where there are no students taking courses at Las Positas in 2016-17). Therefore, information for both TOP Codes are provided in the educational supply section.

In the Bay region on TOP 0708.10 – Computer Networking, there are 14 community colleges issuing 218 awards annually, and seven other postsecondary educational institutions issuing 100 awards annually (16 Postbaccalaureate certificates, 38 Bachelor’s, 13 Associates, and 33 certificates), for a total of 318 awards annually. On TOP 0708.00 - Computer Infrastructure and Support, six colleges are issuing 62 awards annually.

There are six CIP codes that have programs training for the occupational cluster selected:

|  |  |
| --- | --- |
| * 11.0103 Information Technology
 | * 11.1006 Computer Support Specialist
 |
| * 11.0401 Information Science/Studies
 | * 15.1204 Computer Software Technology/Technician
 |
| * 11.0804 Modeling, Virtual Environments and Simulation
 | * 52.1201 Management Information Systems, General
 |

**Table 7. Programs on TOP 0708.10 – Computer Networking or on CIP codes listed above**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| College | Sub-Region | CIP Code | TOP Code | Head-count | Bache-lor’s | No. of Transfers | Asso-ciates | Certifi-cates | Total Awards |
| Cabrillo | SC-Monterey | n/a | 070800 | 335 | 0 | 22 | 0 | 0 | 0 |
| Contra Costa | East Bay | n/a | 070810 | 216 | 0 | 23 | 3 | 12 | 15 |
| 070800 | 0 | 0 | 0 | 0 | 1 | 1 |
| Deanza | Silicon Valley | n/a | 070810 | 151 | 0 | 29 | 10 | 10 | 20 |
| 070800 | 312 | 0 | 36 | 0 | 0 | 0 |
| Diablo Valley | East Bay | n/a | 070810 | 167 | 0 | 10 | 5 | 2 | 7 |
| 070800 | 125 | 0 | 25 | 0 | 0 | 0 |
| Foothill | Silicon Valley | n/a | 070810 | 0 | 0 | 0 | 1 | 0 | 1 |
| 070800 | 304 | 0 | 16 | 0 | 0 | 0 |
| Gavilan | Silicon Valley | n/a | 070810 | 24 | 0 | n<10 | 4 | 1 | 5 |
| 070800 | 95 | 0 | 19 | 1 | 0 | 1 |
| Las Positas | East Bay | n/a | 070810 | 0 | 0 | n<10 | 4 | 1 | 5 |
| 070800 | 184 | 0 | 9 | 0 | 0 | 0 |
| Los Medanos | East Bay | n/a | 070810 | on another TOP | 0 | 0 | 7 | 8 | 15 |
|  | 070800 | 0 | 0 | 4 | 4 | 8 |
| Mission | Silicon Valley | n/a | 070810 | 230 | 0 | 27 | 12 | 28 | 40 |
| 070800 | 43 | 0 | n<10 | 0 | 0 | 0 |
| Monterey | SC-Monterey | n/a | 070810 | 97 | 0 | 11 | 0 | 2 | 2 |
| Ohlone | East Bay | n/a | 070810 | 495 | 0 | 41 | 3 | 17 | 20 |
| 070800 | 64 | 0 | 16 | 0 | 1 | 1 |
| San Francisco | Mid-Peninsula | n/a | 070810 | 1,289 | 0 | 131 | 0 | 50 | 50 |
| 070800 | 345 | 0 | 42 | 39 | 9 | 48 |
| San Jose City | Silicon Valley | n/a | 070810 | 154 | 0 | <10 | 6 | 7 | 13 |
| San Mateo | Mid-Peninsula | n/a | 070810 | 38 | 0 | n<10 | 0 | 0 | 0 |
| 070800 | 0 | 0 | 0 | 1 | 2 | 3 |
| Santa Rosa | North Bay | n/a | 070810 | 39 | 0 | 0 | 0 | 20 | 20 |
| 070800 | 205 | 0 | 29 | 0 | 0 | 0 |
| Skyline | Mid-Peninsula | n/a | 070810 | 0 | 0 | 0 | 4 | 1 | 5 |
| 070800 | 112 | 0 | n<10 | 0 | 0 | 0 |
| Unitek College | East Bay | 11.1006 |  | n/a | 0 | n/a | 0 | 24 | 24 |
| Cogswell College | Silicon Valley | 11.0804 |  | n/a | 3 | n/a | 0 | 0 | 3 |
| 15.1204 |  | n/a | 4 | n/a | 0 | 0 | 4 |
| Empire College | North Bay | 11.0103 |  | n/a | 0 | n/a | 13 | 9 | 22 |
| Golden Gate University | Mid-Peninsula | 11.0401 |  | n/a | 1 | n/a | 0 | 0 | 1 |
| Naval Postgraduate School \*(Postbac Certs) | SC-Monterey | 11.0804 |  | n/a | 16\* | n/a | 0 | 0 | 16 |
| Santa Clara University | Silicon Valley | 52.1201 |  | n/a | 21 | n/a | 0 | 0 | 21 |
| University of San Francisco | Mid-Peninsula | 11.0103 |  | n/a | 8 | n/a | 0 | 0 | 8 |
| 52.1201 |  | n/a | 1 | n/a | 0 | 0 | 1 |
| **Total Bay Region** |  |  | **n/a\*\*** | **54** | **510** | **116** | **234** | **380** |
| **Sub-Total on TOP 070810 in Bay Region** |  | 2,892 | n/a | 294 | 72 | 216 | 318 |
| **Sub-Total on TOP 070800 in Bay Region** |  | 2,110 | n/a | 216 | 44 | 18 | 62 |
| **Total East Bay Sub-Region** |  | **n/a\*\*** | **0** | **126** | **26** | **64** | **96** |
| **Sub-Total on TOP 070810 in East Bay** |  | 878 | n/a | 76 | 22 | 64 | 86 |
| **Sub-Total on TOP 070800 in East Bay** |  | 373 | n/a | 50 | 4 | 6 | 10 |

# *Sources: IPEDS, Data Mart and Launchboard*

NOTE: For community colleges, the annual average for awards is 2014-17. Headcount is for 2016-17, and number of transfer students is for 2015-16. For other postsecondary, the annual average for awards is 2013-16.
\*\*Headcount at the regional and sub-regional level for the two TOP codes added together is not available since there would be double counting of students who are taking courses on both TOP codes at colleges. At the TOP04 level (which would also include TOP06 0708.20 Computer Support), there are 5,188 students in the region and 1,259 students in the sub-region.

# Gap Analysis

The labor market appears to be significantly undersupplied in the Bay Region. On the demand side, there are 6,043 annual openings in the Bay region with 380 annual awards for an annual gap of 5,663. In the East Bay, there are 1,047 annual openings and 96 annual awards for an annual gap of 951. Bachelor’s degrees and Postbaccalaureate Certificates are included in the supply calculation since three of the four SOC codes selected require a Bachelor’s degree for entry. The annual openings for these three SOC codes account for about 85% of the total annual openings in the region and sub-region.

# Student Outcomes

**Table 8a. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0708.10 - Computer Networking in the Bay Region and East Bay Sub-Region**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2015-16** | **Bay Region (All CTE Programs)** | **Las Positas (All CTE Programs)** | **State (0708.10)** | **Bay Region (0708.10)** | **East Bay Sub-Region****(0708.10)** | **Top Colleges in Region****on TOP (0708.10)** |
| % Employed Four Quarters After Exit | 74% | 75% | 72% | 75% | 71% | Santa Rosa | 86%(28 students) |
| Median Earnings Two Quarters After Exit | $10,310 | $11,400 | $9,740 | $11,755 | $9,000 | De Anza | $19,495(20 students) |
| Median % Change in Earnings | 46% | 39% | 49% | 51% | 36% | De Anza | 126%(16 students) |
| % of Students Earning a Living Wage | 63% | 65% | 40% | 74% | 68% | De Anza | 89%(19 students) |

 *Source: Launchboard (version available on 4/21/18)*

**Table 8b. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0708.00 - Computer Infrastructure and Support in the Bay Region and East Bay Sub-Region**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2015-16** | **Bay Region (All CTE Programs)** | **Las Positas (All CTE Programs)** | **State (0708.00)** | **Bay (0708.00)** | **East Bay** **(0708.00)** | **Las Positas****(0708.00)** | **Top Colleges in Region****on TOP (0708.00)** |
| % Employed Four Quarters After Exit | 74% | 75% | 67% | 72% | 78% | 76%(29 students) | Ohlone | 82%(17 students) |
| Median Earnings Two Quarters After Exit | $10,310 | $11,400 | $10,150 | $11,705 | $12,545 | $10,855 | De Anza | $17,750(35 students) |
| Median % Change in Earnings | 46% | 39% | 46% | 39% | 35% | 35% | Cabrillo | 62%(30 students) |
| % of Students Earning a Living Wage | 63% | 65% | 62% | 68% | 75% | 75%(16 students) | De Anza | 78%(27 students) |

 *Source: Launchboard (version available on 4/21/18)*

# Skills, Certifications and Education

**Table 9. Top Skills for Computer Networking Occupations in Bay Region (April 2017 – March 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skill** | **Postings** | **Skill** | **Postings** | **Skill** | **Postings** |
| Teamwork/Collaboration | 4,740 | Salesforce | 1,048 | Product Management | 629 |
| Information Security | 3,052 | C++ | 1,007 | Process Improvement | 628 |
| Project Management | 2,982 | Scheduling | 1,002 | Web Application Development | 628 |
| Java | 2,807 | Software as a Service (SaaS) | 996 | Cisco Switching | 624 |
| Python | 2,732 | PERL Scripting Language | 962 | Security Operations | 618 |
| Linux | 2,708 | Quality Assurance and Control | 945 | Computer Engineering | 616 |
| SQL | 2,517 | OSPF | 934 | Microsoft Active Directory | 603 |
| Oracle | 2,339 | Change Management | 872 | SSL | 596 |
| Business Process | 2,311 | Data Analysis | 856 | Microsoft Visio | 591 |
| Network Engineering | 2,268 | E-Commerce | 852 | Voice over IP (VoIP) | 588 |
| Software Development | 2,255 | Network Troubleshooting | 850 | Splunk | 586 |
| Cisco | 2,196 | Enterprise Resource Planning (ERP) | 842 | Big Data | 563 |
| Business Systems Analysis | 1,950 | Virtualization | 834 | Systems Engineering | 551 |
| Information Systems | 1,851 | DevOps | 809 | System Design | 538 |
| Business Systems | 1,836 | Telecommunications | 805 | Staff Management | 533 |
| Customer Service | 1,741 | Domain Name System (DNS) | 801 | Network Administration | 527 |
| Network Security | 1,733 | Customer Contact | 794 | Product Development | 526 |
| UNIX | 1,478 | System/Network Configuration | 789 | Configuration Management | 508 |
| JavaScript | 1,467 | Network Infrastructure (Edge POE Devices) | 761 | Business Development | 503 |
| Systems Analysis | 1,459 | Juniper Networks | 743 | Sales | 502 |
| Technical Support | 1,327 | Technical Writing / Editing | 738 | Health Insurance Portability & Accountability Act (HIPAA) | 498 |
| Software Engineering | 1,324 | System Administration | 737 | Systems Development | 498 |
| Transmission Control Protocol/Internet Protocol (TCP/IP) | 1,298 | Ruby | 718 | Apache Hadoop | 482 |
| Business Analysis | 1,273 | Debugging | 697 | Agile Development | 480 |
| SAP | 1,237 | Project Planning & Development Skills | 691 | System Architecture | 480 |
| Routers | 1,193 | Extensible Markup Language (XML) | 683 | Scalability Design | 478 |
| Cryptography | 1,160 | Scrum | 671 | Data Warehousing | 468 |
| Wide Area Network (WAN) | 1,108 | Systems Development Life Cycle (SDLC) | 671 | ITIL | 468 |
| Budgeting | 1,054 | VMware | 667 | Disaster Recovery Planning | 466 |
| Virtual Private Networking (VPN) | 1,051 | IT Industry Knowledge | 645 | Accounting | 465 |

*Source: Burning Glass*

**Table 10. Certifications for Computer Networking Occupations in the Bay Region (April 2017 – March 2018)**

Note: 78% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |
| --- | --- | --- | --- |
| **Certification** | **Postings** | **Certification** | **Postings** |
| Certified Information Systems Security Professional (CISSP) | 1,751 | Juniper Networks Certified Internet Associate | 100 |
| Cisco Certified Network Professional (CCNP) | 779 | Juniper Networks Certified Internet Specialist | 91 |
| Certified Information Systems Auditor (CISA) | 765 | GIAC Certified Intrusion Analyst | 89 |
| Certified Information Security Manager (CISM) | 647 | Cisco Certified Design Professional (CCDP) | 87 |
| SANS/GIAC Certification | 621 | Juniper Networks Certified Internet Professional | 84 |
| Cisco Certified Network Associate (CCNA) | 578 | Security+ | 83 |
| Cisco Certified Internetwork Expert (CCIE) | 520 | Juniper Networks Certified Internet Expert | 81 |
| IT Infrastructure Library (ITIL) Certification | 507 | Microsoft Certified Solutions Expert (MCSE) | 71 |
| Project Management Certification | 307 | CompTIA Network+ | 70 |
| Information Systems Certification | 291 | Microsoft Certified Solutions Associate (MCSA) | 65 |
| CompTIA Security+ | 253 | Certified A+ Technician | 63 |
| Security Clearance | 248 | Certified in The Governance of Enterprise IT (CGEIT) | 57 |
| Certified in Risk and Information Systems Control | 201 | Certified Ethical Hacker (CEH) | 53 |
| Driver's License | 175 | Check Point Certified Security Expert | 53 |
| GIAC Certified Incident Handler (GCIH) | 169 | Certified Information Privacy Professional (CIPP) | 49 |
| Project Management Professional (PMP) | 145 | GIAC Certified Forensic Analyst | 46 |
| ITIL Certification | 123 | Certified Scrum Trainer (CST) | 43 |
| Cisco Certified Security Professional | 118 | Certified Scrum Professional (CSP) | 33 |

*Source: Burning Glass*

**Table 11. Education Requirements for Computer Networking Occupations in Bay Region**

Note: 46% of records have been excluded because they do not include a degree level. As a result, the chart below may not be representative of the full sample.

|  |  |  |
| --- | --- | --- |
| **Education (minimum advertised)** |  | **Latest 12 Mos. Postings** |
| High school or vocational training |  | 519 (5%) |
| Associate Degree |  | 264 (2%) |
| Bachelor’s Degree |  | 9,351(87%) |
| Master’s Degree |  | 404 (4%) |
| Doctoral Degree |  | 224 (2%) |

*Source: Burning Glass*

# Methodology

Occupations for this report were identified by use of skills listed in O\*Net descriptions and job descriptions in Burning Glass. Labor demand data is sourced from Economic Modeling Specialists International (EMSI) occupation data and Burning Glass job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CTE Launchboard and CCCCO Data Mart.

# Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard [www.calpassplus.org/Launchboard/](http://www.calpassplus.org/Launchboard/)

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor’s Office MIS system

# Contacts

For more information, please contact:

* Karen Beltramo, Data Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (CoE), karen@baccc.net or (831) 332-1253
* John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, jcarrese@ccsf.edu or (415) 452-5529