

## **Program Endorsement Brief: 0708.00/Computer Infrastructure and Support & 0708.10/Computer Networking**

### ***Network Administration – Windows Certificate of Specialization***

### ***Network Professional Certificate of Achievement***

Orange County Center of Excellence, December 2019

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#### **Summary Analysis**

The Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to three middle-skill occupation Network and Computer Systems Administrators (15-1142), Computer Network Architects (15-1143), and Computer Network Support Specialists (15-1152). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.<sup>1</sup> Although Network and Computer Systems Administrators and Computer Network Architects typically require a bachelor's degree, they are considered middle-skill because approximately one-third of workers in the field have completed some college or an associate degree. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data there appears to be a supply gap for these computer networking occupations in the region. **Therefore, the COE endorses this proposed program.** Reasons include:

#### **Demand:**

- Over the next five years, there is projected to be **1,839 jobs available annually** in the region due to new job growth and replacements, **which is more than the 865 awards conferred annually** by educational institutions in the region.
- Over the past 12 months, there were **7,459 online job postings related to these computer networking occupations**. The highest number of job postings were for systems administrator, network engineer, and network administrator
- The national-level educational attainment data indicates **between 34.7% and 41.1% of workers in the field have completed some college or an associate degree as their highest level of education**.
- **Typical entry level wages for these occupations are between \$25.32 and \$41.12**, which is **higher** than the California Family Needs Calculator (living wage) hourly wage estimate for both counties.

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<sup>1</sup> The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

**Supply:**

- There are **24 community colleges** in the region that have programs related to computer networking, conferring an average of **566 awards annually** between 2016 and 2019.
- Between 2013 and 2016, there were an average of **299 awards conferred annually** in related training programs by non-community college institutions, all of which were generated by **nine individual four-year colleges throughout** the region.

**Occupational Demand**

Exhibit 1, shows the five-year occupational demand projections for these computer networking occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 3% through 2023. There will be nearly 1,840 job openings per year through 2023 due to job growth and replacements.

**Exhibit 1: Occupational demand in Los Angeles and Orange Counties<sup>2</sup>**

Geography	2018 Jobs	2023 Jobs	2018-2023 Change	2018-2023 % Change	Annual Openings
Los Angeles	17,870	18,459	589	3%	1,288
Orange	7,522	7,813	291	4%	552
<b>Total</b>	<b>25,393</b>	<b>26,272</b>	<b>879</b>	<b>3%</b>	<b>1,839</b>

**Wages**—Typical entry-level hourly wages for these computer networking occupations throughout the region are between \$25.32 and \$41.12.<sup>3</sup> Entry-level wages for these occupations are higher than the California Family Needs Calculator hourly wage for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County)<sup>4</sup>. Experienced workers can expect to earn between \$42.39 and \$69.73, which is higher than the California Family Needs Calculator wage estimates for both counties. Regional average wages are below the average statewide wage of \$47.47 for these occupations. Wage information, by county, is included in Appendix A.

**Job Postings**—There were 7,459 online job postings related to these computer networking occupations listed in the past 12 months. The highest number of job postings were for systems administrator, network engineer, and network administrator. The top skills were system administration, Cisco, Linux, Microsoft Active Director, VMware, network engineering, and routers. The top three employers, by number of job postings, in the region were Northrop Grumman, Anthem Blue Cross, and IBM. Of the 7,459 online job postings, 16% listed a minimum education requirement.

**Educational Attainment**—The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for Computer Network Support Specialists and a bachelor’s degree

<sup>2</sup> Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

<sup>3</sup> Entry-level wage is defined as the twenty-fifth percentile hourly wage. Wages for experienced workers are defined as the seventy-fifth percentile hourly wage.

<sup>4</sup> Living wage data was pulled from California Family Needs Calculator on 11/25/19. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

for Network and Computer Systems Administrators and Computer Network Architects. The national-level educational attainment data indicates between 34.7% and 41.1% of workers in the field have completed some college or an associate degree. Of the 16% of computer networking job postings listing a minimum education requirement in Los Angeles/Orange County, 72% (862) requested a high school diploma or vocational training and 28% (332) requested an associate degree.

## Supply

**Community College Supply**—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Computer Science (0706.00), Computer Systems Analysis (0707.30), Computer Infrastructure and Support (0708.00), Computer Networking (0708.10), and Computer Support (0708.20). The program with the most completions in the region was Computer Networking, with a three-year average of 251 awards conferred. Over the past 12 months, there were five other related program recommendation requests from regional community colleges.

**Exhibit 2: Regional community college awards (certificates and degrees), 2015-2018**

TOP Code	Program	College	2015-2016 Awards	2016-2017 Awards	2017-2018 Awards	3-Year Award Average
0706.00	Computer Science	Cerritos	6	15	-	11
		Compton	-	1	1	1
		El Camino	28	26	37	30
		Glendale	2	2	7	4
		LA City	7	14	6	9
		LA Mission	-	-	3	3
		Long Beach	-	7	-	7
		Santa Monica	22	17	19	19
		<b>LA Subtotal</b>	<b>65</b>	<b>82</b>	<b>73</b>	<b>73</b>
		Fullerton	9	18	-	14
		Golden West	-	-	5	5
		Irvine	4	26	40	23
		Orange Coast	10	28	95	44
		Saddleback	13	19	23	18
		Santa Ana	10	7	9	9
		Santiago Canyon	15	17	4	12
		<b>OC Subtotal</b>	<b>61</b>	<b>115</b>	<b>176</b>	<b>117</b>
<b>Supply Subtotal/Average</b>			<b>126</b>	<b>197</b>	<b>249</b>	<b>191</b>
0707.30	Computer Systems Analysis	Cerritos	6	4	-	5
		<b>LA Subtotal</b>	<b>6</b>	<b>4</b>	<b>-</b>	<b>5</b>

TOP Code	Program	College	2015-2016 Awards	2016-2017 Awards	2017-2018 Awards	3-Year Award Average
		Cypress	-	5	2	4
		<b>OC Subtotal</b>	<b>-</b>	<b>5</b>	<b>2</b>	<b>4</b>
<b>Supply Subtotal/Average</b>			<b>6</b>	<b>9</b>	<b>2</b>	<b>6</b>
0708.00	Computer Infrastructure and Support	LA Harbor	-	1	1	1
		LA Mission	-	-	1	1
		LA Valley	6	8	4	6
		Long Beach	1	1	-	1
		Mt San Antonio	16	20	24	20
		Pasadena	-	-	1	1
		West LA	-	-	4	4
		<b>LA Subtotal</b>	<b>23</b>	<b>30</b>	<b>35</b>	<b>29</b>
		Coastline	67	65	49	60
		Cypress	1	1	2	1
		<b>OC Subtotal</b>	<b>68</b>	<b>66</b>	<b>51</b>	<b>62</b>
<b>Supply Subtotal/Average</b>			<b>91</b>	<b>96</b>	<b>86</b>	<b>91</b>
0708.10	Computer Networking	Cerritos	10	8	-	9
		Glendale	-	6	3	5
		LA City	11	37	23	24
		LA Pierce	37	23	37	32
		Long Beach	25	27	-	26
		Mt San Antonio	9	2	8	6
		Rio Hondo	-	-	3	3
		West LA	52	43	73	56
		<b>LA Subtotal</b>	<b>144</b>	<b>146</b>	<b>147</b>	<b>146</b>
		Coastline	20	12	38	23
		Cypress	28	37	70	45
		Irvine	19	12	11	14
		Saddleback	21	17	10	16
		Santa Ana	-	7	13	10
				<b>OC Subtotal</b>	<b>88</b>	<b>85</b>
<b>Supply Subtotal/Average</b>			<b>232</b>	<b>231</b>	<b>289</b>	<b>251</b>
0708.20	Computer Support	Glendale	2	3	10	5
		LA Pierce	14	7	9	10

TOP Code	Program	College	2015-2016 Awards	2016-2017 Awards	2017-2018 Awards	3-Year Award Average
		Long Beach	-	1	-	1
		Pasadena	1	3	7	4
		<b>LA Subtotal</b>	<b>17</b>	<b>14</b>	<b>26</b>	<b>19</b>
		Cypress	3	1	3	2
		Santa Ana	-	10	9	10
		<b>OC Subtotal</b>	<b>3</b>	<b>11</b>	<b>12</b>	<b>9</b>
<b>Supply Subtotal/Average</b>			<b>20</b>	<b>25</b>	<b>38</b>	<b>28</b>
<b>Supply Total/Average</b>			<b>475</b>	<b>558</b>	<b>664</b>	<b>566</b>

**Non-Community College Supply**—Since two of these occupations typically require a bachelor’s degree, it is important to consider the supply from four-year institutions in the region that provide training programs for computer networking occupations. Exhibit 3, on the following page, shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Computer and Information Sciences, General (11.0101), Computer Systems Analysis/Analyst (11.0501), Computer Systems Networking and Telecommunications (11.0901), Computer and Information Systems Security/Information Assurance (11.1103), and Computer Support Specialist (11.1006). Due to different data collection periods, the most recent three-year period of available data is from 2013 to 2016. Between 2013 and 2016, four-year colleges in the region conferred an average of 299 awards annually in related training programs.

**Exhibit 3: Regional non-community college awards, 2013-2016**

CIP Code	Program	College	2013-2014 Awards	2014-2015 Awards	2015-2016 Awards	3-Year Award Average
11.0101	Computer and Information Sciences, General	California Institute of Technology	35	48	56	46
		Loyola Marymount University	8	15	16	13
		Pacific States University	0	0	2	1
		<b>LA Subtotal</b>	<b>43</b>	<b>63</b>	<b>74</b>	<b>60</b>
		Allied American University	0	12	23	12
		Brandman University	17	19	14	17
		Chapman University	5	6	7	6
		University of California-Irvine	39	31	3	24
		<b>OC Subtotal</b>	<b>61</b>	<b>68</b>	<b>47</b>	<b>59</b>
<b>Supply Subtotal/Average</b>			<b>104</b>	<b>131</b>	<b>121</b>	<b>119</b>

11.0501	Computer Systems Analysis/Analyst	University of Phoenix-California	27	9	8	15
		<b>OC Subtotal</b>	<b>27</b>	<b>9</b>	<b>8</b>	<b>15</b>
<b>Supply Subtotal/Average</b>			<b>27</b>	<b>9</b>	<b>8</b>	<b>15</b>
11.0901	Computer Systems Networking and Telecommunications	Mt Sierra College	3	8	6	6
		<b>LA Subtotal</b>	<b>3</b>	<b>8</b>	<b>6</b>	<b>6</b>
		University of Phoenix-California	6	51	55	37
		<b>OC Subtotal</b>	<b>6</b>	<b>51</b>	<b>55</b>	<b>37</b>
<b>Supply Subtotal/Average</b>			<b>9</b>	<b>59</b>	<b>61</b>	<b>43</b>
11.1003	Computer and Information Systems Security/Information Assurance	Mt Sierra College	13	14	9	12
		<b>LA Subtotal</b>	<b>13</b>	<b>14</b>	<b>9</b>	<b>12</b>
		University of Phoenix-California	79	111	74	88
		<b>OC Subtotal</b>	<b>79</b>	<b>111</b>	<b>78</b>	<b>88</b>
<b>Supply Subtotal/Average</b>			<b>92</b>	<b>125</b>	<b>87</b>	<b>101</b>
11.1006	Computer Support Specialist	Southern California Institute of Technology	21	13	32	22
		University of Phoenix-California	2	0	0	1
		<b>OC Subtotal</b>	<b>23</b>	<b>13</b>	<b>32</b>	<b>23</b>
		<b>Supply Subtotal/Average</b>			<b>23</b>	<b>13</b>
<b>Supply Total/Average</b>			<b>255</b>	<b>337</b>	<b>305</b>	<b>299</b>

## Appendix A: Occupational demand and wage data by county

### Exhibit 4. Los Angeles County

Occupation (SOC)	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Network and Computer Systems Administrators (15-1142)	9,470	9,726	256	3%	637	\$34.19	\$43.80	\$54.69
Computer Network Architects (15-1143)	3,610	3,690	80	2%	248	\$41.50	\$55.79	\$70.38
Computer Network Support Specialists (15-1152)	4,790	5,042	252	5%	403	\$25.53	\$32.70	\$42.69
<b>Total</b>	<b>17,870</b>	<b>18,459</b>	<b>589</b>	<b>3%</b>	<b>1,288</b>			

**Exhibit 5. Orange County**

<b>Occupation (SOC)</b>	<b>2018 Jobs</b>	<b>2023 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings (25<sup>th</sup> Percentile)</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings (75<sup>th</sup> Percentile)</b>
Network and Computer Systems Administrators (15-1142)	3,905	4,046	141	4%	271	\$33.30	\$42.66	\$53.27
Computer Network Architects (15-1143)	1,651	1,702	51	3%	117	\$40.34	\$54.18	\$68.32
Computer Network Support Specialists (15-1152)	1,966	2,064	98	5%	164	\$24.85	\$31.86	\$41.65
<b>Total</b>	<b>7,522</b>	<b>7,813</b>	<b>291</b>	<b>4%</b>	<b>552</b>			

**Exhibit 6. Los Angeles and Orange Counties**

<b>Occupation (SOC)</b>	<b>2018 Jobs</b>	<b>2023 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings (25<sup>th</sup> Percentile)</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings (75<sup>th</sup> Percentile)</b>
Network and Computer Systems Administrators (15-1142)	13,375	13,773	398	3%	908	\$33.92	\$43.46	\$54.29
Computer Network Architects (15-1143)	5,261	5,393	132	3%	365	\$41.12	\$55.27	\$69.73
Computer Network Support Specialists (15-1152)	6,756	7,106	350	5%	567	\$25.32	\$32.45	\$42.39
<b>Total</b>	<b>25,393</b>	<b>26,272</b>	<b>879</b>	<b>3%</b>	<b>1,839</b>			

## Appendix B: Sources

- O\*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- Employment Development Department, Unemployment Insurance Dataset
- Living Insight Center for Community Economic Development
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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