

## Program Endorsement Brief: Cyber Defense

Los Angeles/Orange County Center of Excellence, October 2018

### Summary:

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide regional labor market supply and demand data related to cyber defense. 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 relevant occupations.

The following summarizes key findings from this data brief:

- Cyber defense-related jobs are increasing by 4% over the next five years, and more than 1,200 job openings will be available annually due to new job growth and replacement need.
- 19 related program recommendation requests have been received from regional community college between January and September 2018. Twenty-four colleges in the region have programs closely related to program title.
- Between 2014 and 2017, community colleges in the region conferred an average of 467 awards annually (associate degrees and certificates) in related training programs.

**Occupational Demand**—In Los Angeles/Orange County the number of cyber defense-related jobs is projected to increase by 4%. There will be more than 1,200 job openings per year through 2022 (Exhibit 1).

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

Geography	2017 Jobs	2022 Jobs	2017-2022 Change	2017-2022 % Change	Annual Openings
Los Angeles	12,048	12,408	360	3%	831
Orange	5,283	5,552	269	5%	389
<b>Total</b>	<b>17,332</b>	<b>17,960</b>	<b>628</b>	<b>4%</b>	<b>1,220</b>

**Wages**—Entry-level wages for cyber defense-related occupations in the region are between \$23.77 and \$26.90. Entry-level wages are higher than the MIT Living hourly wage for one adult in the region (\$13.54 in Los Angeles County, \$15.31 in Orange County). Experienced workers earn between \$63.88 and \$70.27, which is higher than the living wage. Regional wages are below the average statewide wage for this occupation.

**Job Postings**—There were 1,419 online job postings related to cyber defense listed in the past 12 months. The majority of job postings are for security analysts, security managers, information security analysts, information security managers and security architects. Top specialized skills are:

<sup>1</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.

information security, Linux, network security and cryptography. The top three employers, by number of job postings, in the region are: SMCI, IBM and Northrop Grumman. Certifications listed on job postings include: Certified Information Systems Security Professional (CISSP), Certified Information Systems Auditor (CISA), Certified Information Security Manager (CISM), SANS GIAC Certification and CompTIA Security+.

**Educational Attainment**—The BLS lists a Bachelor’s degree as the typical entry-level education for this occupation. The national-level educational attainment data indicates between 28% and 40% of workers in the field have completed some college or an associate degree. In Los Angeles/Orange County, 92% of job postings request a Bachelor’s degree.

**Community College Supply**—Appendix A shows the three-year average number of awards conferred by community colleges in the related TOP codes: Computer Information Systems (0702.00), Computer Infrastructure and Support (0708.00), Computer Networking (0708.10), Computer Support (0708.20) and World Wide Web Administration (0709.00). The programs with the most completions in the region are: Computer Networking and Computer Information Systems.

Between January and September 2018, there were 19 other related program recommendation requests from regional community college.

**Appendix A: Regional community college awards (certificates and degrees), 2014-2017**

TOP Code	Program	College	2014-15 Awards	2015-16 Awards	2016-2017 Awards	3-Year Award Average
0702.00	Computer Information Systems	Citrus	N/A	N/A	5	5
		Compton	2	2	1	2
		Cypress	5	4	5	5
		East LA	16	14	14	15
		El Camino	12	24	15	17
		Fullerton	7	7	7	7
		Glendale	1	3	2	2
		LA City	2	4	2	3
		LA Harbor	2	N/A	N/A	2
		LA Mission	4	9	3	5
		LA Trade-Tech	19	14	22	18
		Pasadena	N/A	N/A	2	2
		Rio Hondo	9	10	10	10
		Santa Ana	35	5	18	19
		Santiago Canyon	2	2	2	2
West LA	11	5	10	9		

		<b>Subtotal/Average</b>	<b>127</b>	<b>103</b>	<b>118</b>	<b>116</b>
0708.00	Computer Infrastructure and Support	Citrus	6	9	N/A	8
		Coastline	N/A	93	67	80
		Cypress	10	7	1	6
		LA Valley	N/A	N/A	3	3
		Long Beach	1	1	1	1
		Mt San Antonio	15	12	16	14
		<b>Subtotal/Average</b>	<b>32</b>	<b>122</b>	<b>88</b>	<b>81</b>
0708.10	Computer Networking	Cerritos	5	5	10	7
		Coastline	114	14	20	49
		Cypress	30	27	28	28
		Fullerton	1	N/A	N/A	1
		Irvine	27	12	19	19
		LA City	9	6	11	9
		LA Pierce	16	21	32	23
		Long Beach	12	11	25	16
		Mt San Antonio	11	2	9	7
		Saddleback	15	23	21	20
		West LA	35	55	47	46
		<b>Subtotal/Average</b>	<b>275</b>	<b>176</b>	<b>222</b>	<b>224</b>
0708.20	Computer Support	Cypress	3	8	3	5
		Glendale	1	4	2	2
		LA Pierce	6	12	12	10
		Long Beach	2	N/A	N/A	2
		Pasadena	10	12	1	8
		<b>Subtotal/Average</b>	<b>22</b>	<b>36</b>	<b>18</b>	<b>25</b>
0709.00	World Wide Web Administration	Glendale	6	3	3	4
		LA Pierce	4	1	5	3
		Long Beach	N/A	2	5	4
		Saddleback	1	N/A	5	3
		West LA	10	9	7	9
		<b>Subtotal/Average</b>	<b>21</b>	<b>15</b>	<b>25</b>	<b>20</b>
		<b>Total/Average</b>	<b>477</b>	<b>452</b>	<b>471</b>	<b>467</b>

**Appendix B: Occupational demand and wage data by county**

**Exhibit 2. Los Angeles County**

<b>Occupation (SOC)</b>	<b>2017 Jobs</b>	<b>2022 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings</b>
Network and Computer Systems Administrators (15-1142)	9,933	10,091	158	2%	645	\$23.89	\$42.67	\$64.12
Information Security Analysts (15-1122)	2,115	2,318	203	10%	186	\$27.33	\$50.52	\$69.94
<b>Total</b>	<b>12,048</b>	<b>12,408</b>	<b>360</b>	<b>3%</b>	<b>831</b>			

**Exhibit 3. Orange County**

<b>Occupation (SOC)</b>	<b>2017 Jobs</b>	<b>2022 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings</b>
Network and Computer Systems Administrators (15-1142)	4,447	4,590	143	3%	305	\$23.52	\$42.52	\$63.12
Information Security Analysts (15-1122)	836	962	126	15%	84	\$26.06	\$45.20	\$71.32
<b>Total</b>	<b>5,283</b>	<b>5,552</b>	<b>269</b>	<b>5%</b>	<b>389</b>			

**Exhibit 4. Los Angeles and Orange Counties**

<b>Occupation (SOC)</b>	<b>2017 Jobs</b>	<b>2022 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings</b>
Network and Computer Systems Administrators (15-1142)	14,380	14,680	300	2%	951	\$23.77	\$42.61	\$63.88
Information Security Analysts (15-1122)	2,951	3,280	329	11%	270	\$26.90	\$49.20	\$70.27
<b>Total</b>	<b>17,332</b>	<b>17,960</b>	<b>628</b>	<b>4%</b>	<b>1,220</b>			

## Appendix C: 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
- Living Insight Center for Community Economic Development
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- MIT Living Wage

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