Program Endorsement Brief: 0708.00/Computer Infrastructure and Support; 0708.10/ Computer Networking
Cloud Computing, Associate of Science
Cloud Computing, Certificate of Achievement
Cisco Certified Networking Administrator (CCNA), Certificate of Achievement
IT Foundation, Certificate of Achievement
Offensive Security, Certificate of Achievement
Orange County Center of Excellence, November 2021

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met	☐	Endorsed: Some Criteria Met	☒	Not Endorsed	☐
Program Endorsement Criteria						
Supply Gap:	Yes ☐			No ☑ *(see comments below)*		
Living Wage: (Entry-Level, 25th)	Yes ☑			No ☐		
Education:	Yes ☑			No ☐		
Emerging Occupation(s)						
Yes ☐				No ☑		

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 four middle-skill occupations: C*omputer Network Support Specialists* (15-1231), C*omputer User Support Specialists* (15-1232), C*omputer Network Architects* (15-1241), *Network and Computer Systems Administrators* (15-1244). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.[1] Although c*omputer network architects* and *network and computer systems administrators* 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.

Additionally, this report includes data for three above middle-skill occupations: *Computer Systems Analysts* (15-1211), *Information Security Analysts* (15-1212) and *Database Administrators and Architects* (15-1245). Though these occupations are considered above middle-skill, they are included because the other occupations included in this report are pathways to these occupations. 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.

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[1] 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.

Based on the available data there does not appear to be a supply gap for these middle-skill computing and information technology occupations in the region. However, the related training programs that contribute to the supply for the occupations included in this report also train for an additional six occupations that are not included in this report. Therefore, supply is overstated. Furthermore, the majority of annual openings for the occupations in this report typically require some college or an associate's degree, and entry-level wages exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

Demand:
- *Supply Gap Criteria –* Over the next five years, there is projected to be **3,731 middle-skill jobs available annually** in the region due to new job growth and replacements, *which is less than the 6,111 awards conferred annually* by educational institutions in the region.
  - However, educational programs related to computing and information technology train for a variety of computing and information technology occupations, including one below middle-skill, one middle-skill, and four above middle-skill occupations not included in this report. There is projected to be 9,911 job openings available annually for these unincluded occupations in the LA/OC region. **Therefore, supply for the four middle-skill occupations included in this report is overstated.**
- *Living Wage Criteria –*Within Orange County, **all annual middle-skill job openings** have **entry-level wages above the county's living wage ($20.63/hour).**[2]
- *Educational Criteria –*Within the LA/OC region, **68% of the annual middle-skill job openings** for occupations related to computing and information technology **typically require some college or an associate's degree.**
  - Furthermore, the national-level educational attainment data indicates **between 37.4% and 40% of workers in the field have completed some college or an associate degree as their highest level of education.**

Supply:
- There are **28 community colleges** in the LA/OC region that issue awards related to computing, information technology and security, conferring an average of **1,267 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **4,844 awards conferred annually** in related training programs by non-community college institutions, all of which were generated by **43 individual non-community college institutions throughout** the region.

Occupational Demand
Exhibit 1 shows the five-year occupational demand projections for the four middle-skill occupations in this report. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 2% through 2025. There will be more than 3,400 job openings per year through 2025 due to job growth and replacements.

Exhibit 1: Middle-Skill occupational demand in Los Angeles and Orange Counties[3]

Geography	2020 Jobs	2025 Jobs	2020-2025 Change	2020-2025 % Change	Annual Openings
Orange	14,043	14,461	417	3%	1,065
Los Angeles	32,094	32,700	606	2%	2,346
Total	**46,137**	**47,161**	**1,023**	**2%**	**3,411**

Exhibit 2 shows the five-year occupational demand projections for the three above middle-skill occupations in this report. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 4% through 2025. There will be 2,100 job openings per year through 2025 due to job growth and replacements.

Exhibit 2: Above Middle-Skill occupational demand in Los Angeles and Orange Counties

Geography	2020 Jobs	2025 Jobs	2020-2025 Change	2020-2025 % Change	Annual Openings
Orange	8,287	8,674	387	5%	669
Los Angeles	18,321	18,972	651	4%	1,431
Total	**26,608**	**27,646**	**1,038**	**4%**	**2,100**

This report includes employment projection data by Emsi which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.

Wages
The labor market endorsement in this report considers the entry-level hourly wages for the four middle-skill computing and information technology occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

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[3] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Orange County: All annual openings for the four middle-skill computing and information technology occupations have entry-level wages above the living wage for one adult ($20.63 in Orange County). Typical entry-level hourly wages are in a range between $21.38 and $40.96. Experienced workers can expect to earn wages between $35.60 and $71.00, which are higher than the living wage estimate. Orange County's average wages are below the average statewide wage of $41.03 for these occupations.

All annual openings for the three above-middle-skill occupations have entry-level wages above the living wage for one adult ($20.63 in Orange County). Typical entry-level hourly wages are in a range between $33.47 and $43.02. Experienced workers can expect to earn wages between $63.35 and $66.17, which are higher than the living wage estimate. Orange County's average wages are below the average statewide wage of $56.15 for these occupations.

Los Angeles County: All annual openings for the four middle-skill computing and information technology occupations have entry-level wages above the living wage for one adult ($18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between $21.91 and $41.81. Experienced workers can expect to earn wages between $36.48 and $72.57, which are higher than the living wage estimate. Los Angeles County's average wages are below the average statewide wage of $41.03 for these occupations.

All annual openings for the three above middle-skill computing and information technology occupations have entry-level wages above the living wage for one adult ($18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between $34.66 and $44.22. Experienced workers can expect to earn wages between $65.56 and $67.95, which are higher than the living wage estimate. Los Angeles County's average wages are below the average statewide wage of $56.15 for these occupations.

Job Postings
There were 20,134 online job postings related to the four middle-skill computing and information technology occupations listed in the past 12 months. The highest number of job postings were for system administrators, network engineers, IT support specialists, desktop specialists, and IT technicians. The top skills were: technical support, customer service, Microsoft Active Directory, help desk support, and repair. The top three employers, by number of job postings, in the region were: Anthem Blue Cross, Best Buy, and Northrop Grumman.

There were 18,791 online job postings related to the three above middle-skill computing and information technology occupations listed in the past 12 months. The highest number of job postings were for data engineers, business system analysts, senior data engineers, salesforce administrators, and security engineers. The top skills were: SQL, Python, information security, project management, and information systems. The top three employers, by number of job postings, in the region were: Anthem Blue Cross, Deloitte, and Northrop Grumman.

It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.

Educational Attainment

The Bureau of Labor Statistics (BLS) lists the following typical entry-level education requirements for these computing and information technology occupations:

- Some college, no degree: *computer user support specialists*
- Associate degree: *computer network support specialists*
- Bachelor's degree*: computer systems analysts, information security analysts, computer network architects, network and computer systems administrators,* and *database administrators and architects*

In the LA/OC region, the majority of annual middle-skill job openings (68%) typically require some college, no degree or an associate degree. Furthermore, the national-level educational attainment data indicates between 37.4% and 40% of workers in the field have completed some college or an associate degree as their highest level of education. Of the 56% of middle-skill computing and information technology job postings listing a minimum education requirement in Los Angeles/Orange County, 28.3% (3,184) requested high school or vocational training, 60% (6,744) requested a bachelor's degree and 9.5% (1,068) requested an associate degree.

All annual above middle-skill job openings typically require a bachelor's degree. The national-level educational attainment data indicates between 19.3% and 26.5% of workers in the field have completed some college or an associate degree as their highest level of education. Of the 65% of above middle-skill computing and information technology job postings listing a minimum education requirement in Los Angeles/Orange County, 9.7% (1,174) requested high school or vocational training, 84% (10,215) requested a bachelor degree and 3.5% (428) requested an associate degree.

Educational Supply

Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Information Technology, General (0701.00), Computer Information Systems (0702.00), Software Applications (0702.10), Computer Software Development (0707.00), Computer Programming (0707.10), Database Design and Administration (0707.20), Computer Systems Analysis (0707.30), Computer Infrastructure and Support (0708.00), Computer Networking (0708.10), Computer Support (0708.20), and World Wide Web Administration (0709.00). The colleges with the most completions in the region are: Mt. San Antonio, Orange Coast, Coastline, Cypress, and West LA. Over the past 12 months, there were 43 other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2017-2020

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
0701.00	Information Technology, General	OC Subtotal	0	0	0	0
		East LA	15	23	10	16
		LA Harbor	6	-	-	2
		LA Mission	1	1	3	2

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		Long Beach	25	34	64	41
		Mt San Antonio	79	74	90	81
		Santa Monica	-	39	-	13
		West LA	4	4	5	4
		LA Subtotal	**130**	**175**	**172**	**159**
	Supply Subtotal/Average		**130**	**175**	**172**	**159**
0702.00	Computer Information Systems	Cypress	8	5	4	6
		Fullerton	20	15	11	15
		Irvine	-	-	2	1
		Orange Coast	3	4	2	3
		Santa Ana	6	4	2	4
		Santiago Canyon	2	3	4	3
		OC Subtotal	**39**	**31**	**25**	**32**
		Citrus	7	5	8	7
		Compton	-	1	-	0
		East LA	16	19	15	17
		El Camino	18	14	21	18
		Glendale	-	-	5	2
		LA City	4	1	1	2
		LA Mission	9	5	1	5
		LA Trade	14	8	20	14
		Mt San Antonio	-	-	79	26
		Pasadena	1	-	-	0
		Rio Hondo	19	21	10	17
		West LA	6	8	10	8
		LA Subtotal	**94**	**82**	**170**	**115**
	Supply Subtotal/Average		**133**	**113**	**195**	**147**
0702.10	Software Applications	Coastline	4	9	8	7
		Irvine	22	39	48	36
		Saddleback	3	2	7	4
		OC Subtotal	**29**	**50**	**63**	**47**
		Cerritos	3	9	6	6
		LA City	-	-	1	0
		LA Mission	7	2	-	3

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		LA Southwest	2	1	-	1
		Long Beach	-	-	7	2
		Mt San Antonio	3	1	2	2
		Santa Monica	10	18	13	14
		LA Subtotal	**25**	**31**	**29**	**28**
	Supply Subtotal/Average		**54**	**81**	**92**	**76**
0707.00	Computer Software Development	Cypress	1	1	1	1
		Golden West	3	4	2	3
		Orange Coast	7	7	2	5
		Saddleback	3	13	3	6
		OC Subtotal	**14**	**25**	**8**	**16**
		LA City	-	1	-	0
		LA Subtotal	**-**	**1**	**-**	**0**
	Supply Subtotal/Average		**14**	**26**	**8**	**16**
0707.10	Computer Programming	Cypress	18	22	20	20
		Fullerton	-	16	28	15
		Irvine	10	8	4	7
		Orange Coast	29	31	157	72
		Santa Ana	1	13	1	5
		Santiago Canyon	30	9	3	14
		OC Subtotal	**88**	**99**	**213**	**133**
		Cerritos	4	-	2	2
		Citrus	-	-	1	0
		East LA	6	8	4	6
		Glendale	2	2	3	2
		LA City	-	-	6	2
		LA Mission	5	6	4	5
		LA Pierce	9	18	4	10
		LA Southwest	1	-	1	1
		LA Valley	10	7	6	8
		Long Beach	2	4	5	4
		Mt San Antonio	62	119	114	98
		Pasadena	8	11	21	13
		Santa Monica	42	44	46	44

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		West LA	-	1	-	0
		LA Subtotal	**151**	**220**	**217**	**196**
	Supply Subtotal/Average		**239**	**319**	**430**	**329**
0707.20	Database Design and Administration	Santa Ana	4	1	8	4
		OC Subtotal	**4**	**1**	**8**	**4**
		Citrus	-	1	1	1
		Long Beach	1	3	1	2
		Mt San Antonio	4	11	12	9
		Pasadena	-	-	4	1
		Santa Monica	2	1	5	3
		LA Subtotal	**7**	**16**	**23**	**15**
	Supply Subtotal/Average		**11**	**17**	**31**	**20**
0707.30	Computer Systems Analysis	Cypress	5	2	-	2
		OC Subtotal	**5**	**2**	**-**	**2**
		Cerritos	4	2	3	3
		East LA	-	-	1	0
		LA Mission	-	-	1	0
		LA Subtotal	**4**	**2**	**5**	**4**
	Supply Subtotal/Average		**9**	**4**	**5**	**6**
0708.00	Computer Infrastructure and Support	Coastline	65	49	46	53
		Cypress	1	2	3	2
		Orange Coast	-	-	7	2
		OC Subtotal	**66**	**51**	**56**	**58**
		Cerritos	-	-	4	1
		Glendale	-	-	3	1
		LA City	-	-	3	1
		LA Harbor	1	1	1	1
		LA Mission	-	2	12	5
		LA Valley	8	5	2	5
		Long Beach	1	3	8	4
		Mt San Antonio	20	24	24	23
		Pasadena	-	1	1	1
		Rio Hondo	-	-	9	3
		West LA	-	4	15	6
		LA Subtotal	**30**	**40**	**82**	**51**

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		Supply Subtotal/Average	96	91	138	108
0708.10	Computer Networking	Coastline	12	38	59	36
		Cypress	37	70	95	67
		Irvine	12	11	21	15
		Saddleback	17	10	21	16
		Santa Ana	7	14	12	11
		OC Subtotal	**85**	**143**	**208**	**145**
		Cerritos	8	11	9	9
		Glendale	6	3	3	4
		LA City	37	23	-	20
		LA Pierce	23	39	20	27
		Long Beach	27	55	47	43
		Mt San Antonio	2	8	11	7
		Rio Hondo	-	5	7	4
		West LA	43	77	48	56
		LA Subtotal	**146**	**221**	**145**	**171**
		Supply Subtotal/Average	231	364	353	316
0708.20	Computer Support	Cypress	1	3	5	3
		Santa Ana	10	9	-	6
		OC Subtotal	**11**	**12**	**5**	**9**
		Citrus	-	-	1	0
		Glendale	3	10	7	7
		LA Pierce	7	9	8	8
		Long Beach	1	8	14	8
		Pasadena	3	7	30	13
		LA Subtotal	**14**	**34**	**60**	**36**
		Supply Subtotal/Average	25	46	65	45
0709.00	World Wide Web Administration	Saddleback	-	-	2	1
		OC Subtotal	**-**	**-**	**2**	**1**
		Glendale	9	6	7	7
		LA Pierce	5	9	-	5
		Long Beach	4	22	24	17
		West LA	24	13	9	15
		LA Subtotal	**42**	**50**	**40**	**44**
		Supply Subtotal/Average	42	50	42	45

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		Supply Total/Average	**984**	**1,286**	**1,531**	**1,267**

Non-Community College Supply—For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for computing and information technology. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Computer Information Sciences, General (11.0101), Information Technology (11.0103), Computer Programming/Programmer, General (11.0201), Computer Systems Analysis/Analyst (11.0501), Computer Science (11.0701), Data Modeling/ Warehousing and Database Administration (11.0802), Computer Systems Networking and Telecommunications (11.0901), Network and Systems Administration/Administrator (11.1001), and Computer and Information Systems Security/Information Assurance (11.1003). Due to different data collection periods, the most recent three-year period of available data is from 2016 to 2019. Between 2016 and 2019, non-community college institutions in the region conferred an average of 4,844 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2016-2019

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
11.0101	Computer Information Sciences, General	Azusa Pacific University	21	26	30	26
		Brand College	-	2	-	1
		Brandman University	26	20	20	22
		California University of Management and Sciences	127	89	17	78
		Chapman University	5	12	13	10
		Loyola Marymount University	19	42	32	31
		Mount Saint Mary's University	-	-	-	-
		Pacific States University	21	10	5	12
		The Master's University and Seminary	7	6	7	7
		University of California-Irvine	14	13	15	14
		University of La Verne	19	18	39	25

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		University of the People	57	100	80	79
		Vanguard University of Southern California	-	1	-	0
		Supply Subtotal/Average	**316**	**339**	**258**	**304**
11.0103	Information Technology	Abraham Lincoln University	-	1	2	1
		Bethesda University	-	-	-	-
		Brand College	28	37	50	38
		California Intercontinental University	1	-	-	0
		California State University-Dominguez Hills	-	1	5	2
		California State University-Fullerton	8	71	110	63
		California State University-Los Angeles	198	214	206	206
		California State University-Northridge	43	54	54	50
		DeVry University-California	-	-	-	-
		Platt College-Anaheim	-	1	11	4
		Platt College-Los Angeles	-	-	6	2
		Stanbridge University	25	-	-	8
		Trident University International	159	167	162	163
		University of La Verne	-	-	3	1
		University of Phoenix-California	16	60	57	44
		Supply Subtotal/Average	**478**	**606**	**666**	**583**
11.0201	Computer Programming/ Programmer, General	ABCO Technology	18	23	29	23
		Platt College-Anaheim	-	4	4	3
		Platt College-Los Angeles	-	-	-	-
		University of Phoenix-California	43	27	5	25

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		Supply Subtotal/Average	**61**	**54**	**38**	**51**
11.0501	Computer Systems Analysis/ Analyst	Brand College	4	2	-	2
		DeVry University-California	94	55	49	66
		University of Phoenix-California	4	4	-	3
		Supply Subtotal/Average	**102**	**61**	**49**	**71**
11.0701	Computer Science	Biola University	17	21	20	19
		California Institute of Technology	71	60	67	66
		California State Polytechnic University-Pomona	220	246	210	225
		California State University-Dominguez Hills	31	45	61	46
		California State University-Fullerton	257	287	329	291
		California State University-Long Beach	231	273	270	258
		California State University-Los Angeles	177	154	183	171
		California State University-Northridge	112	159	144	138
		Chapman University	23	32	31	29
		Claremont McKenna College	13	12	15	13
		East San Gabriel Valley Regional Occupational Program	5	16	12	11
		Harvey Mudd College	27	45	42	38
		Occidental College	-	3	20	8
		Pitzer College	4	3	5	4
		Pomona College	39	50	36	42
		Scripps College	5	2	12	6
		Southern California Institute of Technology	1	4	2	2

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		The Master's University and Seminary	-	-	-	-
		Trident University International	59	62	76	66
		University of California-Irvine	524	608	661	598
		University of California-Los Angeles	311	344	423	359
		University of Southern California	1,072	1,111	1,129	1,104
		Supply Subtotal/Average	**3,199**	**3,537**	**3,748**	**3,495**
11.0802	Data Modeling/Warehousing and Database Administration	ABCO Technology	3	6	7	5
		University of Phoenix-California	8	4	1	4
		University of Southern California	24	57	54	45
		Supply Subtotal/Average	**35**	**67**	**62**	**55**
11.0901	Computer Systems Networking and Telecommunications	Abraham Lincoln University	-	-	-	-
		Brand College	2	-	2	1
		DeVry University-California	150	112	88	117
		Mt Sierra College	5	4	-	3
		University of California-Irvine	17	23	14	18
		University of Phoenix-California	27	18	3	16
		University of Southern California	1	1	-	1
		Supply Subtotal/Average	**202**	**158**	**107**	**156**
11.1001	Network and Systems Administration/Administrator	ABCO Technology	-	13	5	6
		Brand College	2	6	23	10
		California Intercontinental University	-	1	3	1
		University of Phoenix-California	1	12	13	9
		Supply Subtotal/Average	**3**	**32**	**44**	**26**

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
11.1003	Computer and Information Systems Security/ Information Assurance	Azusa Pacific University	3	-	-	1
		Learnet Academy Inc	48	17	-	22
		Loyola Marymount University	-	-	-	-
		Mt Sierra College	8	13	-	7
		University of Phoenix-California	71	42	32	48
		University of Southern California	35	20	20	25
		Supply Subtotal/Average	**165**	**92**	**52**	**103**
		Supply Total/Average	**4,561**	**4,946**	**5,024**	**4,844**

Appendix A: Occupational demand and wage data by county

Exhibit 4. Orange County

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Computer Network Support Specialists (15-1231)	1,686	1,732	47	3%	132	$26.56	$32.06	$39.81
Computer User Support Specialists (15-1232)	7,479	7,766	287	4%	607	$21.38	$27.34	$35.60
Computer Network Architects (15-1241)	1,659	1,685	26	2%	105	$40.96	$56.84	$71.00
Network and Computer Systems Administrators (15-1244)	3,220	3,277	58	2%	220	$34.79	$44.99	$56.03
Middle-Skill Total	**14,043**	**14,461**	**416**	**3%**	**1,064**			
Computer Systems Analysts (15-1211)	5,814	5,993	178	3%	444	$38.85	$51.05	$64.01
Information Security Analysts (15-1212)	988	1,153	166	17%	109	$43.02	$54.13	$66.17

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Database Administrators and Architects (15-1245)	1,485	1,528	43	3%	117	$33.47	$46.44	$63.35
Above Middle-Skill Total	**8,287**	**8,674**	**387**	**5%**	**669**			
Total	**22,330**	**23,135**	**804**	**4%**	**1,734**			

Exhibit 5. Los Angeles County

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Computer Network Support Specialists (15-1231)	4,018	4,130	112	3%	315	$26.79	$32.33	$40.10
Computer User Support Specialists (15-1232)	16,671	17,089	418	3%	1,298	$21.91	$28.02	$36.48
Computer Network Architects (15-1241)	3,493	3,500	8	0%	210	$41.81	$58.06	$72.57
Network and Computer Systems Administrators (15-1244)	7,912	7,981	69	1%	522	$35.44	$45.82	$57.02
Middle-Skill Total	**32,094**	**32,700**	**606**	**2%**	**2,346**			
Computer Systems Analysts (15-1211)	5,814	5,993	178	3%	444	$38.85	$51.05	$64.01
Information Security Analysts (15-1212)	988	1,153	166	17%	109	$43.02	$54.13	$66.17
Database Administrators and Architects (15-1245)	1,485	1,528	43	3%	117	$33.47	$46.44	$63.35

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Above Middle-Skill Total	18,321	18,972	651	4%	1,431			
Total	50,415	51,672	1,257	2%	3,777			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings
Computer Network Support Specialists (15-1231)	5,703	5,862	159	3%	448
Computer User Support Specialists (15-1232)	24,150	24,855	705	3%	1,906
Computer Network Architects (15-1241)	5,152	5,185	33	1%	315
Network and Computer Systems Administrators (15-1244)	11,132	11,259	126	1%	743
Middle Skill Total	**46,137**	**47,161**	**1,023**	**2%**	**3,411**
Computer Systems Analysts (15-1211)	18,529	18,979	450	2%	1,385
Information Security Analysts (15-1212)	3,031	3,487	456	15%	321
Database Administrators and Architects (15-1245)	5,048	5,180	132	3%	394
Above Middle Skill Total	**26,608**	**27,646**	**1,038**	**4%**	**2,100**
Total	**72,745**	**74,807**	**2,061**	**3%**	**5,511**

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
- 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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