Cloud Computing – Amazon Web Services (AWS)

Los Angeles and Orange Counties

September 2018

Research Summary

The Los Angeles/Orange County Center of Excellence (COE) compiled this report to provide regional labor market supply and demand data related to **cloud computing** and **Amazon Web Services (AWS).** The following summarizes key findings from this data brief:

- There were **83,010 job postings** over the last 12 months for occupations associated with cloud computing in the Los Angeles/Orange County region.
- **4,876 job postings included "AWS"** as a desired skill for employment.
- On average, regional community colleges conferred **974 awards** (associate degrees + certificates) annually in information technology programs, between 2014 and 2017.

Cloud computing

The introduction of cloud computing to the ever-growing world of information technology is introducing significant changes not only to technology processes but to the workforce. Cloud computing allows for the storage, management, and processing of data using internet technologies ("the cloud"). Amazon Web Services[1] (AWS), the largest provider of cloud computing, identifies five advantages for its use:

1. Payment for data center and server-type resources on an as needed basis.
2. Cost savings due to economies of scale.
3. Removes the issue of estimating for infrastructure capacity.
4. No more physical infrastructure and associated costs.
5. Global reach and access.

Uses of cloud computing

Cloud computing is utilized by a wide variety of organizations, including small businesses, large global corporations, government agencies and not-for-profits. Services available through cloud computing include[2]:

- Creation of new apps and services.
- Storage, back up, and recovery of data.

[1] https://aws.amazon.com/what-is-cloud-computing/
[2] https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/

- Website and blog hosting.
- Audio and video streaming.
- Delivery of software on demand.
- Analyzation of data for patterns and predictions.

One emerging technology intertwined with cloud computing is Artificial Intelligence (AI). The convergence of cloud computing and AI allows users and machines to analyze and gather larger quantities of data at a faster rate.[3] While this ability reduces time and cost, it requires additional resources to be invested into information security and safeguarding against cyber threats. It is projected that the number of information security analyst jobs will grow by 12% in the region through 2022.[4] In response to this uptick in demand for security-related IT jobs, community colleges are developing and expanding programs that prepare students to meet industry needs.

Impact on workforce and training

With the introduction and implementation of cloud computing and AI into the information technology workforce, community colleges and other training providers will need to integrate these skills and technologies into the current curricula and training. Local community colleges currently offer several programs that train students in databases, programming, Linux, DevOps, quality assurance, and information security. Individual colleges are attempting to stack or leverage certificates for cloud computing careers paths with related disciplines, including small business, computer science, web development, business analytics, IT and mobile developers.

The emergence of cloud computing has preempted incumbent IT workers to upskill based on workforce and employer needs. With the right training, workers with traditional IT skills—such as data engineers, enterprise architects, web developers, and networking engineers—can transition into a higher-paying cloud computing career.

Occupational outlook for cloud computing (Los Angeles and Orange Counties)

Businesses that employ cloud computing workers use various job titles, which are explored below. In the region, major cloud computing employers include Deloitte, Amazon, Costar Realty Information, Raytheon, Northrop Grumman, Aerospace Corp, KPMG, SMCI, and Accenture. Traditional occupations with cloud computing elements in their expanding job descriptions, as well as the labor market demand are provided in the table below.

[3] https://www.networkworld.com/article/3154363/cloud-computing/how-ai-is-transforming-cloud-computing.html
[4] https://www.economicmodeling.com/

Los Angeles/Orange County demand for cloud computing workers

SOC/O*NET	Occupation	Annual openings (2017-2022)	Sample job titles	Job Postings (Last 12 months)
15-1132	Software Developers, Applications	2,669	Application developer; software architect; software engineer	31,058
15-1151	Computer User Support Specialists	2,265	Network technician; computer specialist	9,102
15-1121	Computer Systems Analysts	1,472	Applications analyst; computer analyst; system analyst	6,131
15-1199.02	Computer Systems Engineers/Architects*	1,176*	Network engineer; system architect	7,815
15-1199.09	Information Technology Project Managers*	1,176*	IT manager; project manager	6,418
15-1142	Network and Computer Systems Administrators	977	Information analyst; network administrator; network manager; systems administrator	3,939
15-1134	Web Developers	821	Web architect; webmaster; web design specialist	8,208
15-1143	Computer Network Architects	349	Network consultant; design engineer network analyst	2,270
15-1141	Database Administrators	299	Data architect; database coordinator; database programmer; database developer	4,350
15-1122	Information Security Analysts	277	Data security administrator; network security analyst; systems analyst	3,719
	Total Annual Openings	**10,305**	**Total Job Postings**	**83,010**

*The data presented for this occupation are based on the 6-digit SOC code for Computer Occupations, all other (15-1199). Number is counted once in the total. Source: Emsi, 2018

Over the last 12 months…

83,010
job postings for the 10 occupations associated with cloud computing

25%
of the 83,010 jobs postings list cloud computing skills

4,876
job postings list "AWS" as a skill

Employer required certifications and skills

In addition to the standard occupations shown above, cloud computing job postings include any of the following skills and/or certificates:

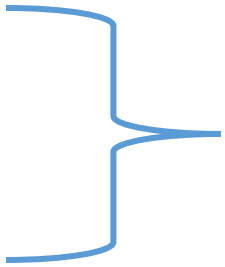
Skills
Amazon Web Services (AWS)
Artificial Intelligence (AI)
Big Data
Cloud Computing
Computer Engineering
Information Technology Industry
Infrastructure as a Service (IaaS)
Platform as a Service (PaaS)
Software as a Service (SaaS)
Virtual Private Networking (VPN)
Virtualization
Web Application Development Knowledge

Certificates
AWS Certified DevOps Engineer
AWS Certified Solutions Architect
Certified Cloud Security Professional
Cisco Certified Network Associate (CCNA)
Cloud Security Alliance's Certificate of Cloud Security Knowledge (CCSK)
CompTIA Network+
CompTIA Security+
VMware Certified Professional (VCP)

AWS Certifications

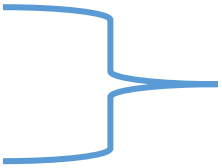
AWS currently offers nine certifications: a foundational certification, three associate-level certifications, two professional-level certifications, and three specialty certifications. Community colleges are well-positioned to offer requisite training and education for students to obtain six of the nine specialty certifications.

AWS Certified Cloud Practitioner
AWS Certified Developer – Associate
AWS Certified SysOps Administrator – Associate
AWS Certified Solutions Architect – Associate
AWS Certified Big Data – Specialty
AWS Certified Security – Specialty



Community college relevant

AWS Certified DevOps Engineer – Professional
AWS Certified Solutions Architect – Professional
AWS Certified Advanced Networking – Specialty



Professional experience required

Existing community college training programs

TOP Code	Program name	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Yr Average
0701.00	Information Technology, General	Coastline	1	-	-	1
		Cypress	-	-	1	1
		East LA	-	4	8	6
		LA Harbor	-	-	1	1
		LA Mission	-	-	4	4
		LA Southwest	-	3	-	3
		Long Beach	7	10	27	15
		Mt. San Antonio	84	72	49	68
		West LA	2	2	3	2
		Subtotal	**94**	**91**	**93**	**93**
0702.00	Computer Information Systems	Citrus	-	-	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	3	3
		LA Harbor	2	-	-	2
		LA Mission	4	9	3	5

TOP Code	Program name	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Yr Average
		LA Trade-Tech	19	14	23	19
		Pasadena	-	-	2	2
		Rio Hondo	9	10	10	10
		Santa Ana	35	5	18	19
		Santiago Canyon	2	2	2	2
		West LA	11	5	13	10
		Subtotal	**127**	**103**	**123**	**118**
0702.10	Software Applications	Cerritos	2	2	4	3
		Coastline	15	7	9	10
		Cypress	-	2	-	2
		Fullerton	-	-	1	1
		Irvine Valley	15	26	28	23
		LA City	-	-	2	2
		LA Mission	3	-	2	3
		LA Southwest	3	1	2	2
		Mt. San Antonio	1	1	2	1
		Pasadena	-	-	2	2
		Saddleback	7	9	9	8
		Santa Monica	12	21	17	17
		Subtotal	**58**	**69**	**78**	**68**
0706.00	Computer Science (Transfer)	Cerritos	-	6	6	6
		El Camino	9	16	27	17
		Fullerton	7	4	9	7
		Glendale	2	2	2	2
		Irvine Valley	1	4	4	3
		LA City	2	3	7	4
		LA Southwest	4	3	-	4
		Orange Coast	1	5	10	5
		Saddleback	4	8	13	8
		Santa Ana	10	14	10	11
		Santa Monica	8	6	22	12
		Santiago Canyon	23	9	15	16
		Subtotal	**71**	**80**	**125**	**92**
0707.00	Computer Software Development	Cypress	-	2	1	2
		Golden West	4	4	7	5
		Orange Coast	8	4	5	6
		Pasadena	-	4	4	4
		Saddleback	3	3	3	3
		Subtotal	**15**	**17**	**20**	**17**
0707.10	Computer Programming	Cerritos	1	1	1	1
		Coastline	1	3	-	2
		Cypress	19	11	27	19

TOP Code	Program name	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Yr Average
		East LA	8	4	5	6
		Glendale	3	4	1	3
		Irvine Valley	18	29	16	21
		LA City	-	-	43	43
		LA Mission	1	1	2	1
		LA Pierce	8	4	6	6
		LA Southwest	1	1	2	1
		LA Valley	7	12	26	15
		Long Beach	1	1	-	1
		Mt. San Antonio	72	66	68	69
		Orange Coast	4	10	29	14
		Pasadena	5	6	1	4
		Santa Monica	24	29	25	26
		Subtotal	**173**	**182**	**252**	**202**
0707.20	Database Design and Administration	Mt. San Antonio	3	7	11	7
		Santa Monica	1	1	2	1
		Subtotal	**4**	**8**	**13**	**8**
0707.30	Computer Systems Analysis	Cerritos	1	3	6	3
		Cypress	1	8	-	5
		Subtotal	**2**	**11**	**6**	**6**
0708.00	Computer Infrastructure and Support	Citrus	6	9	-	8
		Coastline	-	93	67	80
		Cypress	10	7	1	6
		LA Valley	-	-	6	6
		Long Beach	1	1	1	1
		Mt. San Antonio	15	12	16	14
		Subtotal	**32**	**122**	**91**	**82**
0708.10	Computer Networking	Cerritos	5	5	10	7
		Coastline	114	14	20	49
		Cypress	30	27	28	28
		Fullerton	1	-	-	1
		Irvine Valley	27	12	19	19
		LA City	9	6	11	9
		LA Pierce	16	21	37	25
		Long Beach	12	11	25	16
		Mt. San Antonio	11	2	9	7
		Saddleback	15	23	21	20
		West LA	35	55	52	47
		Subtotal	**275**	**176**	**232**	**228**
0708.20	Computer Support	Cypress	3	8	3	5
		Glendale	1	4	2	2
		LA Pierce	6	12	14	11

TOP Code	Program name	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Yr Average
		Long Beach	2	-	-	2
		Pasadena	10	12	1	8
		Subtotal	**22**	**36**	**20**	**26**
0709.00	World Wide Web Administration	Glendale	6	3	3	4
		LA Pierce	4	1	5	3
		Long Beach	-	2	5	4
		Saddleback	1	-	5	3
		West LA	10	9	8	9
		Subtotal	**21**	**15**	**26**	**21**
0709.10	E-Commerce (Technology emphasis)	Saddleback	3	2	-	3
		Subtotal	**3**	**2**	**-**	**3**
0799.00	Other Information Technology	LA Harbor	-	-	1	1
		Mt. San Antonio	11	13	9	11
		Subtotal	**11**	**13**	**10**	**11**
		Grand Total/Average	**908**	**925**	**1,089**	**974**

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