SPECIAL REPORT

2016 IT Skills and Salary Report

A Comprehensive Study from Global Knowledge

Global Knowledge®

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Survey Methodology and Report Details

The 2016 IT Skills and Salary Survey was conducted online from September 21 to October 23, 2015. Global Knowledge and partner companies and organizations emailed more than half a million survey invitations to recipients in their databases. Links were also provided in online newsletters. The survey yielded more than 14,000 completed responses from around the globe, with over 70 percent coming from the United States and Canada. The online survey was tabulated using IBM SPSS and Q Research software. The 2016 IT Skills and Salary Report focuses on North America, where 8,923 IT professionals and 1,263 business professionals shared their input.

INTRODUCTION

Confidence is contagious and so is lack of confidence, and a customer will recognize both.

— VINCE LOMBARDI

Confidence, be it in an individual, a team or a company, can be the distinguishing factor between success and failure in the market. After all, both internal and external customers will recognize a professional's and an organization's confidence level and make their choices accordingly. Having the knowledge, skills and expertise to perform the tasks that your role requires is a sure-fire way to instill and convey confidence in yourself and in your organization.

In our 2016 IT Skills and Salary Survey, the ninth for Global Knowledge, we continued to explore IT professionals' skills and salaries and the factors that influence both.

New this year is insight directly from application developers, including the tools and languages they use most.

For the second year, we asked IT decision-makers (ITDMs) to share their opinions, calling on them to elaborate on:

- Skills gaps and how they affect an IT organization's ability to deliver.
- Where and why skills gaps exist.
- The value of certification to their team members.

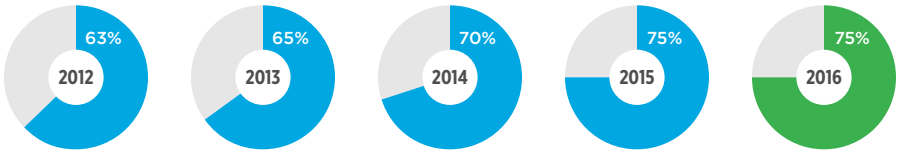
We again pulled in non-IT professionals to get their take on training, certification and workplace challenges.

PARTICIPANT PROFILE

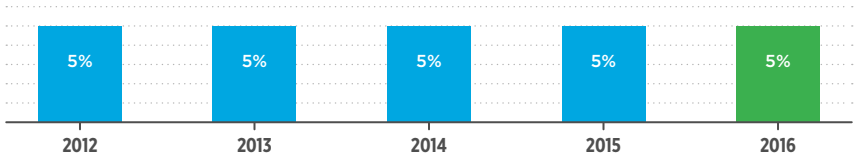
Base Salary

2012	2013	2014	2015	2016
$84,552	$78,649	$88,952	$89,891	$87,606

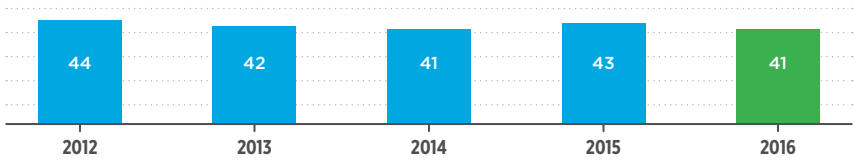
Received a Raise



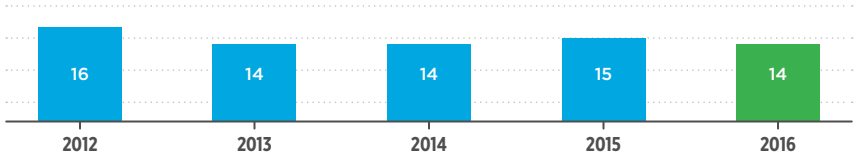
Raise Percentage



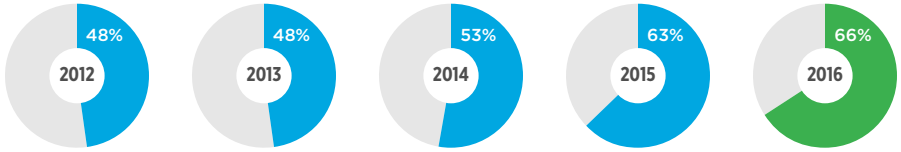
Average Age



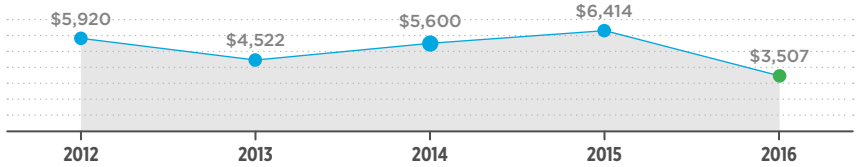
Average Tenure



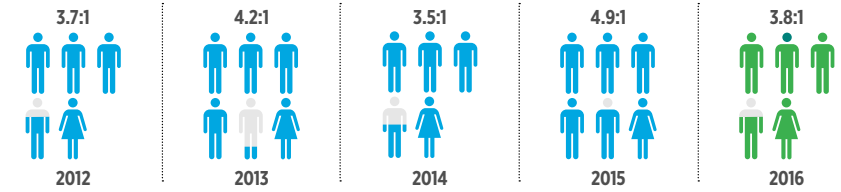
Received a Bonus



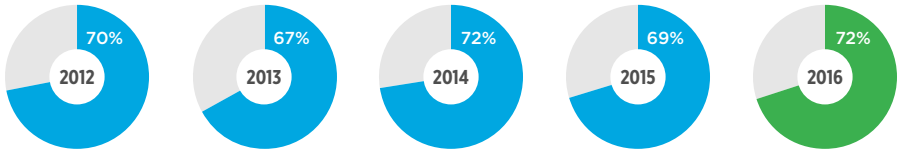
Average Bonus



Male-to-Female Ratio



College Degree



OVERRIDING TRENDS

AVERAGE SALARIES FOR IT PROFESSIONALS ARE ON THE RISE, WHILE NON-IT PROFESSIONALS' SALARIES ARE LOWER.

Though combined average salaries for IT professionals and decision-makers fell by two percentage points—from $88,835 to $86,545—average salaries increased for each group, from $75,889 to $76,865 for IT staff and from $109,165 to $111,167 for ITDMs.

The lower total average is due to a change in the distribution of these two groups within the response pool. Staff-level IT respondents increased from 63 percent in 2015 to 72 percent in 2016. Conversely, ITDM respondents dropped from 37 percent in 2015 to 28 percent in 2016.

Non-IT salaries took a plunge this year, averaging $95,019 after last year's $109,165 and bringing figures back in line with those from 2014. A nine percent increase in the number of entry-level—and therefore lower-paid—respondents is at least partly to blame for that decline.

For IT personnel, other measures showed some improvement. The percentage of respondents reporting a raise reached 75 for the second year in a row, and 66 percent reported receiving a bonus—the highest percentage we've ever reported. The percentage of decision-makers who saw a bonus increased to 70, up from last year's 64 percent. Non-IT professionals, however, saw a decline in the percentage reporting a bonus—59 percent versus 74 percent in the previous year, a substantial drop.

EXISTING SKILLS GAPS INCREASE STRESS ON EMPLOYEES.

When asked to candidly assess their organizational fitness, 31 percent of ITDMs reported measurable gaps in their group's technical skill sets. An equal percentage reported that, while they are OK today, they have looming concerns for the next two years. The biggest impact of those skills gaps? Seventy percent of ITDMs said the gaps mean increased stress on existing employees. On a positive note, 38 percent reported that their IT groups have the skills needed for today and for the next 12 to 24 months, up from 32 percent in 2015.

CYBERSECURITY, CLOUD COMPUTING AND NETWORKING SKILLS ARE IN DEMAND.

IT security tops the list of ITDMs' in-demand skills for their teams. ITDMs also identified skills in cloud computing, IT architecture, and network and systems engineering and operations as high-priority needs. Furthermore, one of three ITDMs reported having difficulty finding skilled talent to fill cybersecurity positions, while one of five reported difficulty filling cloud-related ones. Demonstrating the principles of supply and demand, respondents with job roles in cloud computing, IT architecture and security reported higher average salaries than those with job roles in other areas.

BUILDING NEW SKILLS IS THE TOP DRIVER FOR PROFESSIONAL DEVELOPMENT, WHILE LACK OF BUDGET IS THE TOP OBSTACLE.

Three-fourths of this year's IT respondents said they participate in some form of professional development to build new skills, and half said preparing for a career certification or specialist exam is a top motivator. More than 45 percent of those who did not train in the previous year said that their organizations did not allocate funds for professional development. According to ITDM respondents, lack of training funds is also one of the driving reasons behind skills gaps in IT departments.

COMPENSATION

Making money is art and working is art and good business is the best art.

— ANDY WARHOL

When it comes to earning potential, several factors are usually at play at any given time. These include personal factors, such as education, certification, years on the job and personality, as well as other factors, including geography, company size, industry trends, technological changes, and the overall ebb and flow in global and regional economies.

One-fourth of this year's IT respondents reported a salary under $60,000. The median salary for these respondents is $81,300, down four percent from the prior year's $85,000. Changes in salary figures emerged from numerous factors, including the composition of the respondent base, overall economic influences and changes in overall workforce structure. Compared to last year's study, this year's respondents are slightly less educated and have fewer certifications on average, all of which contribute to a lower overall level of pay by whatever metrics might apply to that population.

We collected compensation data, including base salaries plus bonuses if applicable, for respondents and compared it to respondents' levels of responsibility on the job, ranging from entry-level to executive levels.

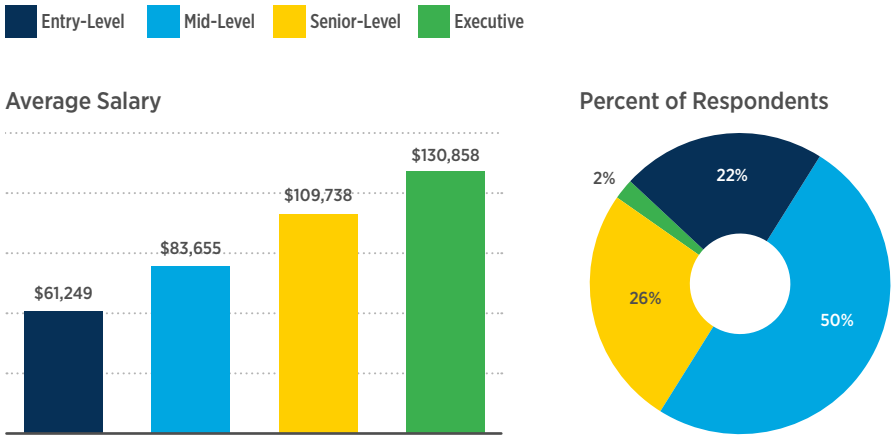
Entry-level IT staff (specialists, analysts, associates, level 1, etc.) account for 22 percent of this year's technical respondents. Average salary for this group is $61,249 (with a median of $58,195), where typical job roles include senior help desk specialist, network technician and business systems analyst.

Mid-level professionals (managers and team leads) form the core of this year's respondent base, accounting for 50 percent of IT respondents and 61 percent of non-IT respondents. The average salary for mid-level IT pros who have job roles such as manager of information security, manager of network operations and manager of applications systems architecture is $83,655, with a median of $80,000. The average salary for non-IT mid-level managers and solo contributors is $90,669 with a median of $89,160.

Respondents in senior-level roles account for more than one-fourth of this year's IT participants, with titles such as director of systems engineering, vice president or director of corporate applications and vice president or director of enterprise infrastructure. Average salary for these technical positions exceeds $109,000, with a median of $105,000. Twenty-one percent of non-IT respondents are in senior-level roles, earning an average salary of $120,000 with a median of $115,000.

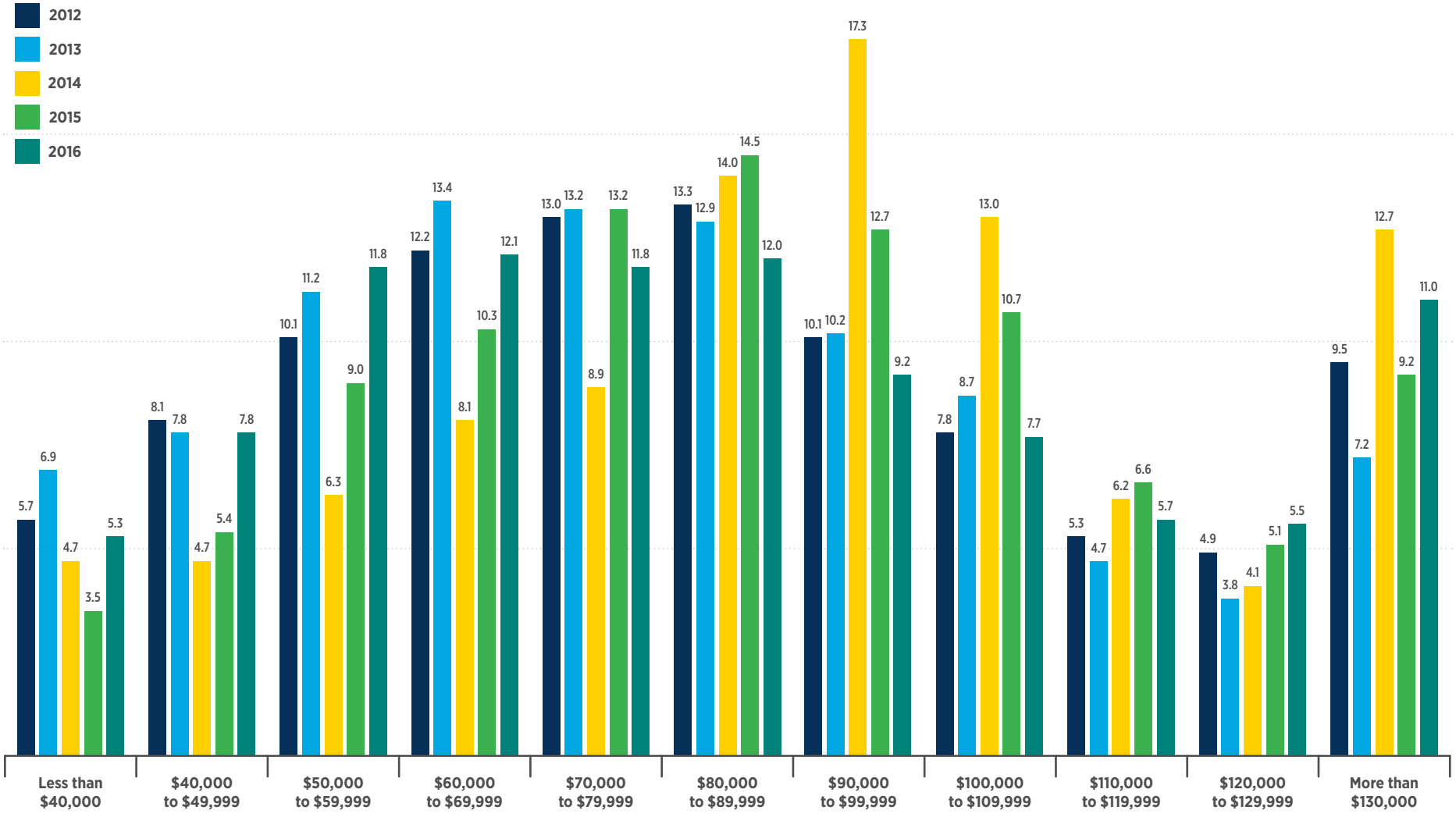
Executives with roles such as president, partner and CxO account for two percent of technical respondents and reported an average salary of $130,858, with a median of $125,000.

SALARY BY LEVEL OF RESPONSIBILITY (TOTAL IT)



Entry-level respondents earn an average of 47 cents to every dollar an executive-level respondent earns, and the average salary for mid-level respondents is 37 percent higher than that of entry-level IT professionals. This is up from 31 percent in 2015. Respondents in senior positions realized a bump of 33 percent over their mid-level counterparts, and executives typically saw a bump of 20 percent over their direct reports. All of this data strongly confirms the correlation of job seniority with job tenure and responsibilities as reflected in job titles and levels associated with such job roles. Overall, compensation is up three percent from last year's study but still reflects some drag from continuing slow economic growth and organizations' ongoing conservatism regarding employee compensation.

SALARY RANGE OF IT RESPONDENTS IN PERCENT



FUNCTIONAL AREAS AND JOB ROLES

Nearly half of this year's technical respondents represent five functional areas: IT security, help desk, system operations, systems engineering and network engineering. From an average salary perspective, five areas top the list: cloud computing ($115,826), IT architecture ($113,499), IT security ($104,949), business technology ($101,663) and enterprise infrastructure management ($101,390). These levels of pay also indicate relatively high seniority for those who occupy such positions, by virtue of either extended tenure on the job or possessing in-demand knowledge and skills.

Within functional areas there is significant variation in average salaries across specific job roles. For some job roles, such as enterprise architect, information security analyst, and IT risk and compliance manager, pay is up, as the market seeks to satisfy the demand for capable and available candidates.

With additional responsibility comes increased compensation and an opportunity to diversify skills through the pursuit of advanced training and certifications. This is illustrated clearly in the IT security area where the range of salary difference between security specialists and the vice presidents or directors who lead such organizational units is as high as over $63,000.

SALARY BY FUNCTIONAL AREA

IT Functional Area	Mean	Median	Count
Cloud computing	$115,826	$118,000	11 8
IT architecture	$113,499	$110,000	356
IT security	$104,949	$102,000	1,184
Business technology	$101,663	$95,000	187
Enterprise infrastructure management	$101,390	$96,000	345
Java developers	$99,763	$97,000	69
Project/Program management	$98,607	$94,750	580
Data warehousing / Business intelligence	$93,522	$86,105	86
Business application development	$92,037	$90,000	198
Voice engineering	$91,489	$85,600	318
Systems engineering	$89,554	$87,500	795
Business analysis	$86,809	$85,000	301
Network engineering	$86,158	$81,000	1,185
Database management/development	$83,752	$82,000	151
.NET developer	$83,484	$80,000	88
Storage/SAN	$78,799	$77,000	34
Web/intranet/extranet	$76,781	$70,000	94
System operations	$71,002	$65,000	1,069
Network operations	$69,993	$65,000	933
Help desk	$57,286	$51,500	763
All others	$90,761	$87,490	69

SALARY WITHIN FUNCTIONAL AREA

IT Functional Area	Mean	Median
IT architecture		
Director, Architecture	$157,057	$155,000
Director, Applications Systems Architecture	$122,509	$115,000
Manager, Applications Systems Architecture	$109,725	$116,000
Sr. Applications Systems Architect	$112,170	$110,500
Applications Systems Architect	$96,253	$91,000
Information Architect	$99,095	$98,800
Sr. Data Architect	$90,132	$82,500
Data Architect	$90,481	$98,010
Enterprise Architect	$115,978	$110,000
IT security		
VP/Director, Information Security	$141,124	$135,000
Manager, Information Security	$113,970	$113,214
Security Architect	$122,237	$116,500
Information Security Analyst (Jr. or Sr.)	$87,942	$87,000
Sr. Security Administrator	$102,190	$99,840
Security Administrator	$76,709	$73,000
IT Risk and Compliance Manager	$110,660	$110,011
Data Security Specialist (Jr. or Sr.)	$77,645	$72,000
Network operations		
Director (Senior Manager)	$91,339	$85,000
Manager	$84,072	$80,000
Sr. Network Technician	$77,895	$80,000
Network Technician	$60,306	$56,000
Sr. Network Administrator (LAN, WAN)	$83,193	$80,000
Network Administrator (LAN, WAN)	$63,328	$60,500
Project/Program management		
VP/Director Project/Program Management	$136,770	$133,100
Manager/Sr. Manager Project/Program Management	$101,255	$99,000
Project/Program Coordinator	$86,226	$86,000
Project/Program Analyst	$75,410	$75,950
Systems engineering		
Director	$93,359	$77,000
Manager	$110,073	$100,000
Sr. Systems Engineer	$96,306	$95,000
Systems Engineer	$74,466	$73,219

RAISES AND BONUSES

In addition to salary and benefits like insurance and paid time off, raises and bonuses can add substantially to overall compensation.

Three out of four respondents reported receiving a raise in the prior year. This is consistent with 2015 results and up five points from 2014. The percentage receiving a raise has risen each year since reaching an all-time low of 43 in 2010.

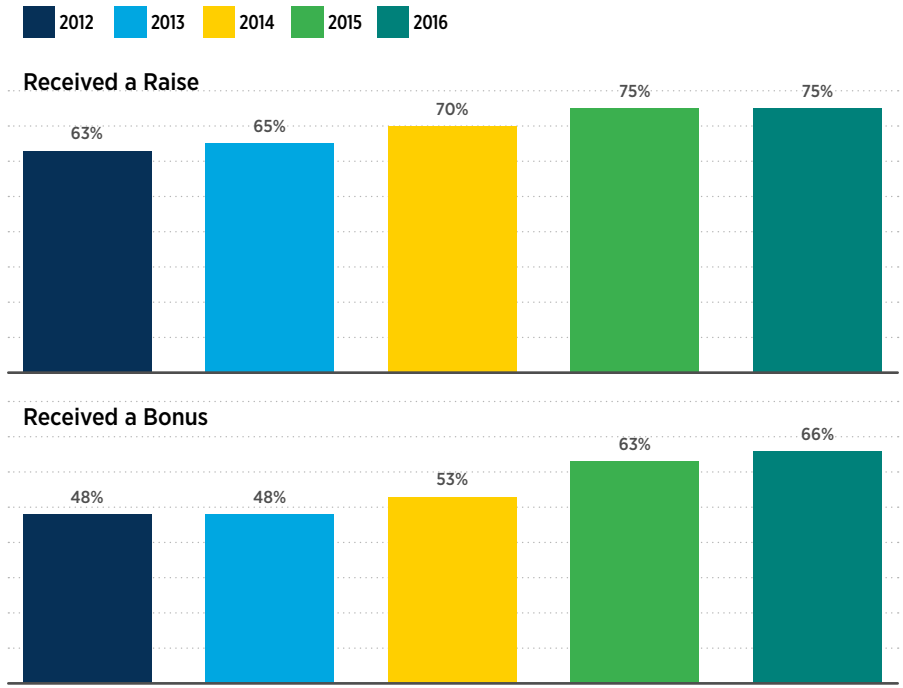
Those who saw a raise attributed it primarily to their performance on the job and standard company increases. This is consistent with last year's data. Other popular reasons include internal promotions, taking on new responsibilities and developing new skills.

Respondents reporting that they received a bonus reached a new level of 66 percent. Just as with raises, the percentage indicating they received a bonus has increased steadily since reaching its lowest point in 2010.

Not all respondents were bonus eligible—in fact, 24 percent of technical staff respondents said they were not, consistent with 2015 data. That rate drops to 18 percent for ITDMs and 22 percent for non-technical respondents.

Of those who were bonus eligible, 34 percent did not receive a bonus in the prior year (37 percent for IT staff, 29 percent for ITDMs and 22 percent for non-IT). For those who were eligible and did receive a bonus, the typical amount was one to five percent of annual pay, with 59 percent of staff, 43 percent of ITDMs and 46 percent of non-IT respondents receiving a bonus in this range. ITDMs were significantly more likely than staff to receive a bonus greater than five percent. In fact, 30 percent of ITDMs received a bonus of 11 percent or greater, compared to 16 percent of IT staff.

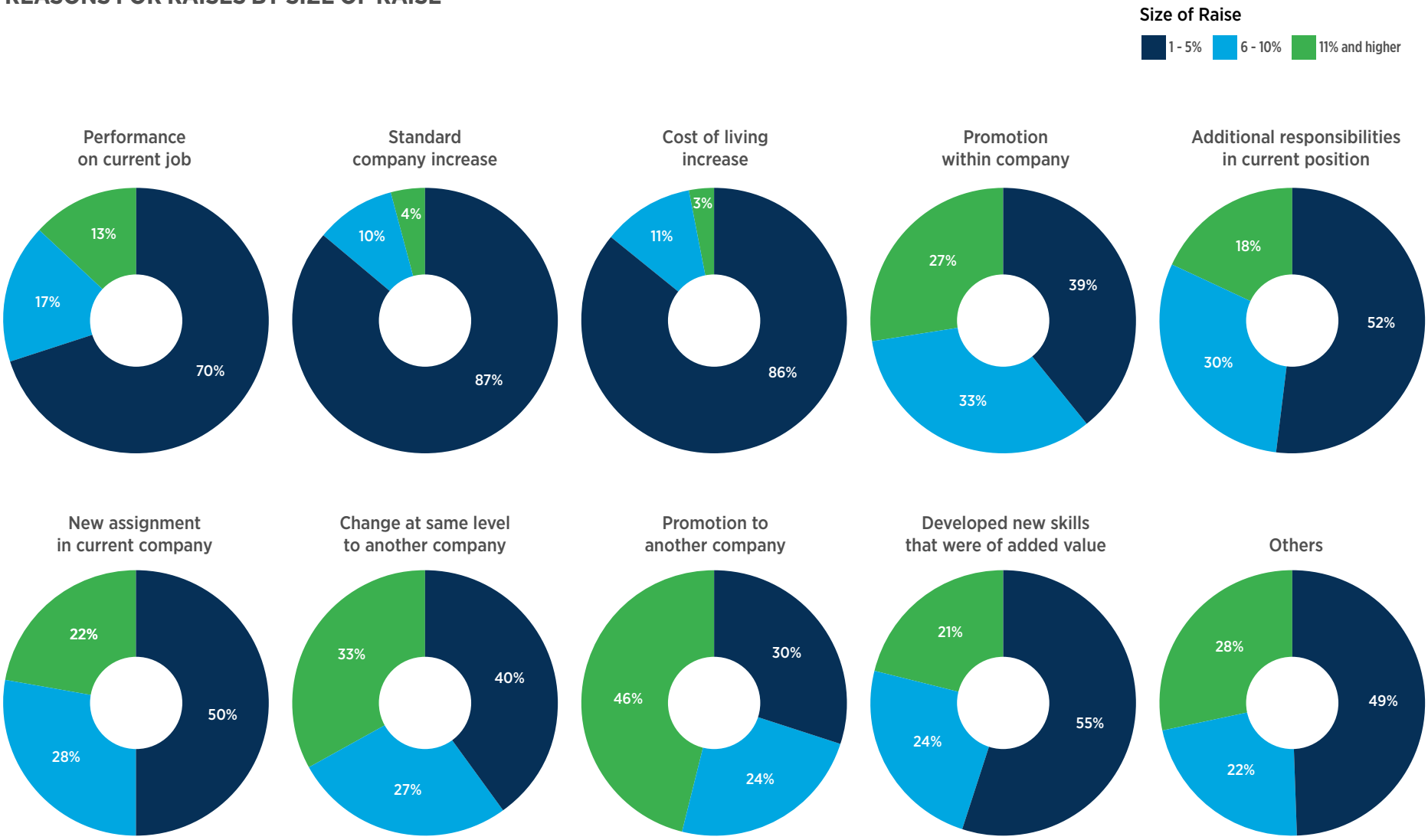
PERCENT RECEIVING RAISES AND BONUSES



HOW SKILLS AND RESPONSIBILITIES AFFECT RAISES

For those receiving a raise up to five percent, typical reasons cited include a cost of living increase, performance in their current jobs or standard company raises across the board. Those receiving a moderate raise (six to 10 percent) were more likely to attribute it to taking on new responsibilities in their current position, internal promotion, new assignment at their current company or developing new skills. Those reporting a significant raise (11 percent or greater) were more likely to attribute it to promotion (both external and internal), bringing valuable new skills to the table or external lateral moves.

REASONS FOR RAISES BY SIZE OF RAISE



WHEN CHANGE HAPPENS

One-third of respondents indicated they considered leaving their present field for another career. This skews lower for ITDMs (29 percent) but up for non-IT professionals (44 percent). Fourteen percent relocated to take a new position. One in four (24 percent) moved to a new employer. Thirty-five percent stated they changed job roles in the previous year, ranging from 30 percent for ITDMs up to 37 percent for non-IT professionals.

Looking more closely at high-demand specialties, it's likely that increasing innovation and new technology adoptions will force change into IT organizations. Thus, continuing advancement toward cloud-based operations and the Internet of Things could accelerate these trends as ITDMs seek to reconfigure their teams to maximize opportunities in the market.

COMPANY SIZE

Employee headcount, both at a specific location and for the company or organization as a whole, remains a key factor when determining compensation and job function. It also plays a substantial role in the type of person attracted to an organization. Some professionals need the challenge and responsibility that comes with wearing multiple hats in a small company, whereas others prefer the specialization and defined job ladders found in larger organizations.

From a salary perspective, larger companies pay their technical staff an average of $23,723 more than firms with fewer than 100 employees. For ITDMs the bump is $7,329, or 12 percent, over the average for the smallest firms. The trend is more significant for non-IT respondents who see an average salary difference of $24,438, or 40 percent, between the largest and smallest firms.

SALARIES BY NUMBER OF EMPLOYEES

Total Employees	IT Staff			IT Decision-Makers			Non-IT		
	Mean	Median	Count	Mean	Median	Count	Mean	Median	Count
1 - 99	$60,619	$55,000	760	$106,501	$100,000	457	$75,721	$65,000	135
100 - 499	$66,201	$62,000	1,160	$105,117	$100,000	489	$83,586	$77,150	176
500 - 999	$70,367	$66,000	725	$110,903	$105,000	249	$96,386	$97,499	109
1,000 - 4,999	$75,049	$71,000	1,523	$105,293	$100,000	500	$87,981	$82,000	338
5,000+	$84,342	$81,000	2,234	$113,830	$110,000	826	$100,159	$95,000	505
Total	$74,445	$70,000	6,402	$108,829	$103,000	2,521	$91,653	$85,000	1,263

INDUSTRY

For technical staff across all industries, the average salary ranges from $62,027 in the educational services sector to $91,428 for those who support systems integration. Technical employees at systems integrators such as Bechtel Group and General Dynamics earn the highest average salaries at just over $108,300, ranging from $91,428 for technical staff to $119,559 for ITDMs.

Decision-makers tasked with leading IT operations earn an average of 45 percent more than their staff counterparts ($111,146 versus $76,858). Salaries for ITDMs range from $89,728 in educational services to $134,242 in mining and natural resources. Non-IT respondents earn an average of $95,019, ranging from $83,713 for those in educational services to over $105,000 for those in banking and finance.

IT SALARIES BY INDUSTRY

Industry	IT Staff		IT Decision-Makers		Total IT	
	Mean	Median	Mean	Median	Mean	Median
VAR and IS integration	$91,428	$77,000	$119,559	$115,000	$108,348	$97,000
IT communication manufacturing	$89,555	$84,500	$128,339	$130,000	$100,738	$100,000
Natural resources: Mining, oil, gas	$90,925	$90,000	$134,242	$117,450	$100,551	$96,000
Media, film, music	$82,782	$81,650	$132,819	$120,000	$95,854	$89,000
IT consulting	$79,368	$75,000	$115,700	$110,000	$95,156	$88,000
Banking and finance	$84,872	$83,000	$115,974	$111,450	$94,861	$90,000
Insurance, real estate, legal	$82,422	$80,000	$121,510	$120,000	$94,651	$91,825
Pharmaceutical, medical, biotech	$82,283	$82,000	$120,273	$115,000	$93,373	$91,500
Professional business services	$79,216	$76,000	$119,664	$112,500	$92,638	$89,500
Aerospace/Defense	$81,808	$80,000	$119,720	$115,000	$91,836	$90,000
Transportation or public utilities	$81,745	$80,000	$102,906	$95,000	$87,894	$85,000
Hospitality, travel and recreation	$73,419	$75,000	$108,225	$100,000	$87,705	$80,000
Government: Military and homeland security	$78,221	$72,000	$112,434	$105,500	$86,971	$82,000
Healthcare	$77,933	$75,000	$105,489	$100,410	$85,335	$83,000
Government: Nondefense, state, local	$78,000	$76,950	$108,652	$104,250	$84,461	$81,000
Retail	$74,499	$74,000	$123,774	$130,000	$83,511	$82,000
Telecommunications	$74,806	$73,000	$107,741	$102,425	$82,631	$80,000
IT-related services	$71,670	$65,845	$105,528	$100,000	$81,885	$75,000
Manufacturing: Industrial	$74,413	$65,500	$102,734	$103,000	$81,653	$73,481
Construction, architecture, engineering	$72,592	$67,685	$101,321	$100,000	$80,946	$79,875
Manufacturing: Consumer	$74,831	$70,000	$102,995	$98,700	$79,247	$72,000
Nonprofit	$66,389	$62,000	$100,091	$87,000	$72,623	$70,000
Education services	$62,027	$59,640	$89,728	$85,000	$68,254	$64,000

GEOGRAPHY

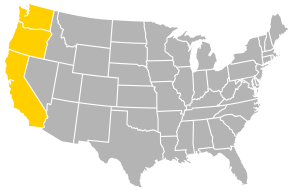
UNITED STATES

A region's cost of living is one of the strongest drivers behind salary. For IT staff in the continental U.S., the average salary ranges 18 percent from a high of $80,720 in the Mid-Atlantic region, with markets such as New York and Philadelphia, to a low of $68,185 in the East South Central region that includes markets such as Louisville, Memphis or Birmingham. Clearly, variation exists within any given region as well. Major metro areas that have higher costs of living than rural areas usually command higher base salaries to match.

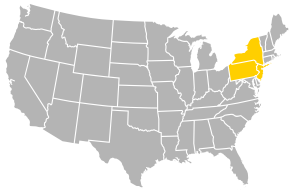
For example, the average salary for ITIL®-certified professionals (both staff and decision-makers) ranges from $92,000 in Mountain markets such as Albuquerque, Colorado Springs or Casper to $105,842 in Pacific markets such as San Diego, Orange County or Portland, Oregon. Cisco-certified professionals see a similar geographic variation, with salaries in Mountain markets such as Phoenix, Denver and Boise averaging $75,396, while those in South Atlantic markets such as Atlanta and Washington average $86,670.

Top 5 Total IT Salary	
Washington, D.C.	$104,265
Virginia	$103,395
Maryland	$99,678
California	$96,066
New York	$95,219

Bottom 5 Total IT Salary	
New Mexico	$67,217
Wyoming	$65,602
Vermont	$62,361
North Dakota	$62,125
West Virginia	$61,348

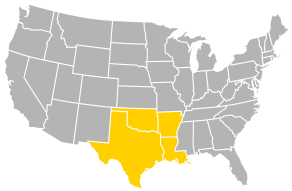


1. PACIFIC
MEAN: $92,881
MEDIAN: $87,801

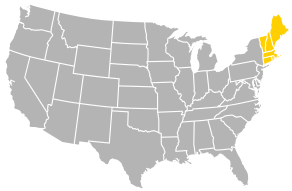


2. MID-ATLANTIC
MEAN: $91,703
MEDIAN: $85,000

3. SOUTH ATLANTIC
MEAN: $90,056
MEDIAN: $85,000

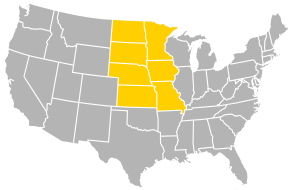


4. WEST SOUTH CENTRAL
MEAN: $84,345
MEDIAN: $80,000

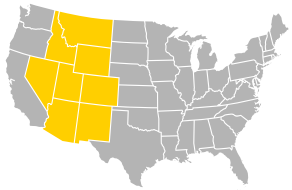


5. NEW ENGLAND
MEAN: $83,506
MEDIAN: $76,000

6. EAST NORTH CENTRAL
MEAN: $82,960
MEDIAN: $80,000



7. WEST NORTH CENTRAL
MEAN: $81,537
MEDIAN: $77,350



8. MOUNTAIN
MEAN: $80,910
MEDIAN: $75,000

9. EAST SOUTH CENTRAL
MEAN: $78,052
MEDIAN: $72,841

For a complete list of salaries by state, see page 60.

CANADA

While salaries in Canada are somewhat lower than those in the U.S., both in absolute terms and in terms of buying power in their home locations, Canadian salaries show the same kinds of regional and geographic variability that we see in the U.S.

Overall, IT professionals working in Canada earn an average of CA$85,045, with averages for IT technical staff exceeding CA$78,000 and exceeding CA$111,000 for ITDMs. Provincial variations range from CA$68,657 in New Brunswick to CA$90,537 in Alberta, which is down from the 2015 study and is consistent with a down market for oil and gas.

From a certification viewpoint, Project Management Professional® (PMP®)-certified respondents show a peak salary of CA$100,820 in Ontario and CA$103,000 in Alberta. Microsoft-certified professionals' salaries range from CA$73,411 in British Columbia to CA$86,758 Alberta.

JOB SECURITY STANDS STRONG

Sixty percent of respondents agreed that they feel more secure than last year, while 18 percent disagreed and 22 percent were unsure. Further analysis revealed that professionals who think management values their contributions also feel more secure and satisfied at work.

Such a sense of job security does not mean, however, that employees are less likely to consider new opportunities. Consistent with the previous two years, more than 40 percent of respondents plan to seek new positions in 2016. Further, 14 percent of respondents said they relocated in the prior year to take a new position. One-fourth of respondents changed employers during 2015, and one-third changed job roles without changing employers.

1. ALBERTA
MEAN: $90,537
MEDIAN: $85,200

2. ONTARIO
MEAN: $86,798
MEDIAN: $82,500

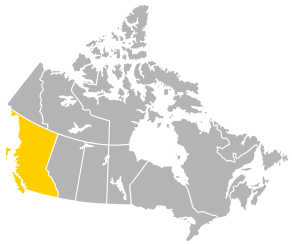
3. QUEBEC
MEAN: $85,558
MEDIAN: $85,577

4. SASKATCHEWAN
MEAN: $83,037
MEDIAN: $81,040

5. MANITOBA
MEAN: $79,749
MEDIAN: $72,600

6. OTHERS*
MEAN: $79,671
MEDIAN: $75,015

7. NOVA SCOTIA
MEAN: $79,421
MEDIAN: $75,000



8. BRITISH COLUMBIA
MEAN: $79,230
MEDIAN: $69,225

9. NEW BRUNSWICK
MEAN: $68,657
MEDIAN: $66,466

*Twenty respondents were from Prince Edward Island, Newfoundland, Labrador and the three territories Yukon, Nunavut and Northwest Territories.

For a complete list of salaries by province see page 62.

PROFESSIONAL DEVELOPMENT

There are no secrets to success. It is the result of preparation, hard work and learning from failure.

— COLIN POWELL

Advancing one's career requires regular attention, daily discipline and concentrated effort. Professional development takes on many guises, embracing everything from reading a blog post on virtualization or downloading a white paper on Agile deployment, to attending a multiday certification prep course or participating in a cybersecurity conference. We asked respondents for their views on professional development, including the methods they use to keep current, its importance to their present career stage, and the kinds of activities they plan to pursue this year.

When determining the best ways to keep skills up to date, professionals must weigh benefits with cost, including direct expenses such as course price, travel and lodging, as well as indirect costs like time away from work. Our respondents demonstrated that benefits of professional development appear to justify the investment.

When asked to select benefits of professional development, 89 percent of respondents chose staying current on technological changes. It ranked higher for ITDMs (91 percent) and lower for non-IT professionals (83 percent), with technology staff falling between those two values.

Among respondents' perceived benefits, significant variation exists depending on their levels of responsibility and career tenure. However, all respondents shared the viewpoint that training, either skills-based or certification-focused, allows them to gain insight critical to their current roles. Respondents early in their careers or in entry-level positions view training as a means to develop skills that will be useful in future positions (71 percent for entry-level vs. 52 percent for executives). Similar trends are present for developing a sense of personal accomplishment, advancing career objectives and developing professional confidence.

Many respondents see professional development as a path toward greater personal economic potential, but it is not the primary reason they seek to benefit from training. In fact, overall, earnings rank number eight—over 30 percentage points behind staying up to date on technological changes. Those early in their careers are more apt to list a boost in earnings as a perceived benefit when compared to senior and executive-level respondents.

PERCEIVED BENEFITS OF PROFESSIONAL DEVELOPMENT

Possible Benefit	Responsibility Level				
	Entry-level	Mid-level	Senior-level	Executive	Total
Stay up to date on technological changes.	87%	89%	91%	92%	89%
Gain insight that enables me to be more effective in my current role.	77%	77%	77%	78%	77%
Develop skills that will be useful for future positions.	71%	66%	62%	52%	66%
Develop a sense of personal accomplishment.	70%	64%	61%	53%	65%
Advance my career objectives.	70%	62%	61%	46%	63%
Develop professional confidence.	66%	62%	57%	52%	61%
Obtain knowledge that I can share with my colleagues.	57%	59%	59%	61%	59%
Obtain greater earning potential.	65%	58%	55%	44%	58%
Gain from the knowledge of others.	60%	59%	56%	59%	58%
Achieve a higher level of professional status.	62%	56%	54%	37%	56%
Increase my sense of job security.	57%	47%	43%	28%	48%
Interact with others in my profession.	44%	48%	47%	53%	47%
Prepare for the unknown.	47%	43%	43%	43%	44%
Better my standing with management.	40%	38%	36%	32%	37%
Develop an advantage over my peers.	36%	32%	31%	31%	33%
Get closer to strategy, business or customers.	26%	31%	36%	53%	32%

Increasing one's skills can be seen as a means of building a cushion in the area of job security. In theory, lower-skilled employees will be let go before those with more in-demand skills. This trend shows up clearly when looking through the lens of responsibility level. Over half (57 percent) of entry-level respondents stated training leads to an increased personal sense of job security. This declined nearly 30 points for executives (28 percent). Those farther along in their careers see professional development as a means of gaining knowledge necessary for creating more effective business strategies. Senior managers and executives also see interacting with peers and developing deeper customer relationships as key benefits that may be obtained from professional development.

HOW PROFESSIONALS STAY UP TO DATE

On average, respondents provided a total of seven different methods of keeping their knowledge and skills up to date. Nearly all of them (85 percent) reported researching topics online. After that, there is significant variation according to job role, tenure and level of responsibility. For example, ITDMs are most likely to report downloading a white paper (72 percent vs. 59 percent overall). Conversely, non-technology professionals are more apt to participate in classroom training and formal training sessions at their worksites compared to those in IT positions.

As a way to pick up new information in a quick shot, two-thirds of respondents use webinars. This skews up for those in senior and executive positions as compared to those in staff- and entry-level roles. Fifty-one percent of entry-level professionals reported attending webinars, as compared to 75 percent of those in executive roles. Attendance at conferences and seminars also increases with tenure and level of responsibility, with 47 percent of entry-level respondents versus 82 percent of executives reporting attending such events.

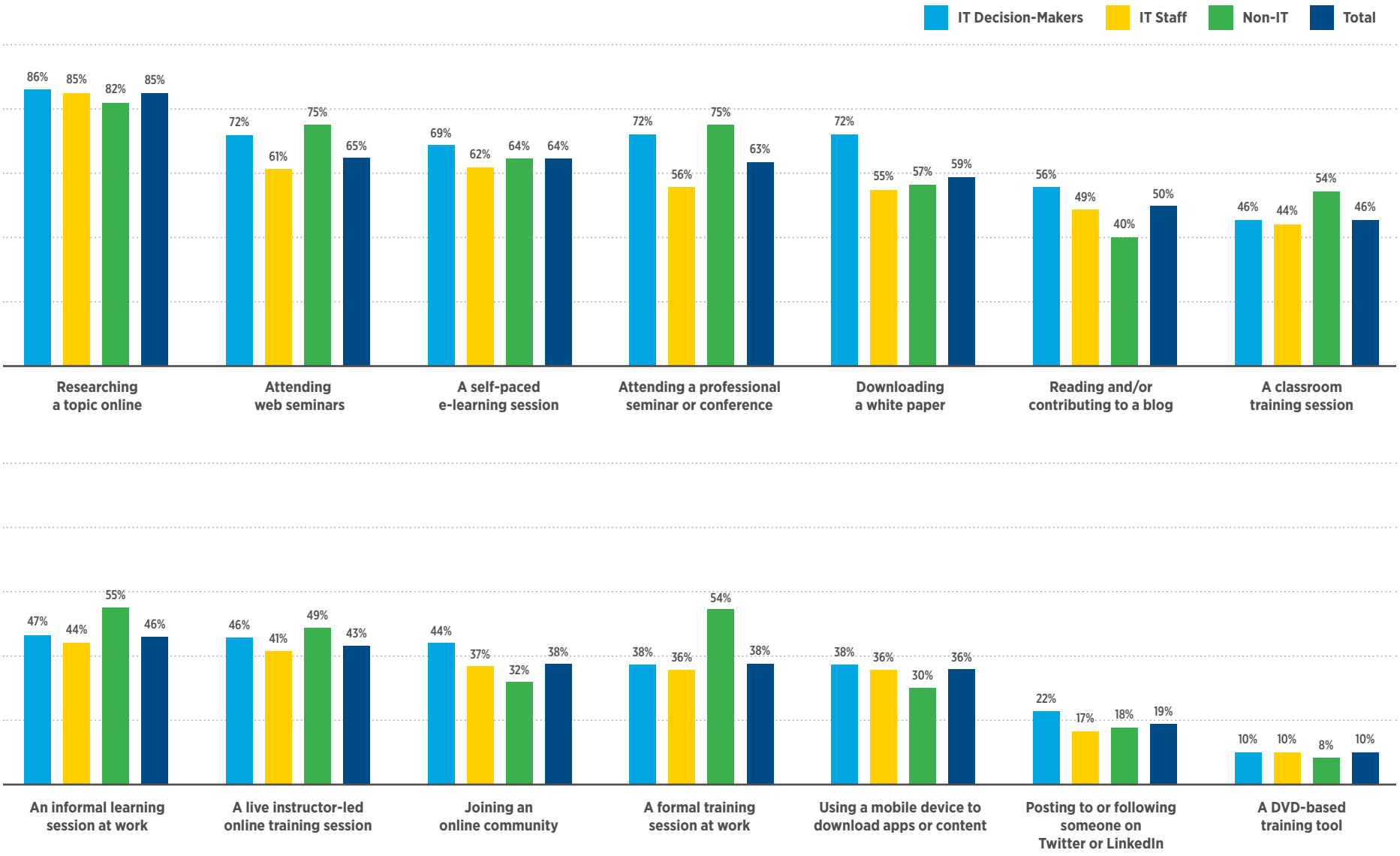
When it comes to identifying a preferred learning method, answers vary. Overall, respondents prefer classroom training sessions delivered out of office and self-paced e-learning methods almost equally, with those two choices combined accounting for over 60 percent of responses. Non-technical professionals show greater preference for off-site classroom training, whereas those in development positions skew toward self-paced online methods.

Because time available for training competes with work tasks, respondents reported turning to methods that afford them greater control over their learning and its timing, both inside and outside of normal working hours. These self-directed methods include online videos, online communities, hands-on labs for technical training, printed materials and seeking mentoring from seasoned professionals. What's appealing about all of these things, aside from their content and coverage, is professionals' ability to fit learning activities around their busy work schedules.

Eighty-five percent of respondents reported using online video for educational purposes. Technology professionals at both staff and management levels are more apt than non-technology respondents to report using video as a means of gaining insight (86 percent vs. 80 percent). From a satisfaction standpoint, 81 percent reported being satisfied (59 percent moderately and 22 percent completely satisfied) with online video's ability to impart useful information. Somewhat surprisingly, online video appeals across all age groups, despite the common notion that videos are more interesting and enticing to younger members of the workforce.

Given the prevalence and popularity of digital resources, it is interesting that 75 percent of respondents reported turning to printed materials in their search for information. Other methods are used less frequently: hands-on labs (58 percent), online communities (55 percent, though higher with developers and lower with non-IT professionals), and mentoring (31 percent). Apparently, there is still something satisfying about reading text on paper, even though a screen of some kind is never far from professionals these days.

METHODS FOR KEEPING SKILLS CURRENT



WHY PROFESSIONALS TRAIN

Professionals train for many reasons. Perceived benefits aside, across the spectrum of roles, 75 percent of technology professionals said they train to deepen their existing skills and to gain exposure to new topics, tools and technologies. Preparing for a certification or specialist exam is the second most frequently mentioned reason for training, at 49 percent overall. This skews up to 57 percent for those who function as IT staff but work outside a formal IT department, and it dips down to 32 percent for developers. The importance of certification is of lesser concern to developers than it is to other tech professionals in roles such as security, systems and networking.

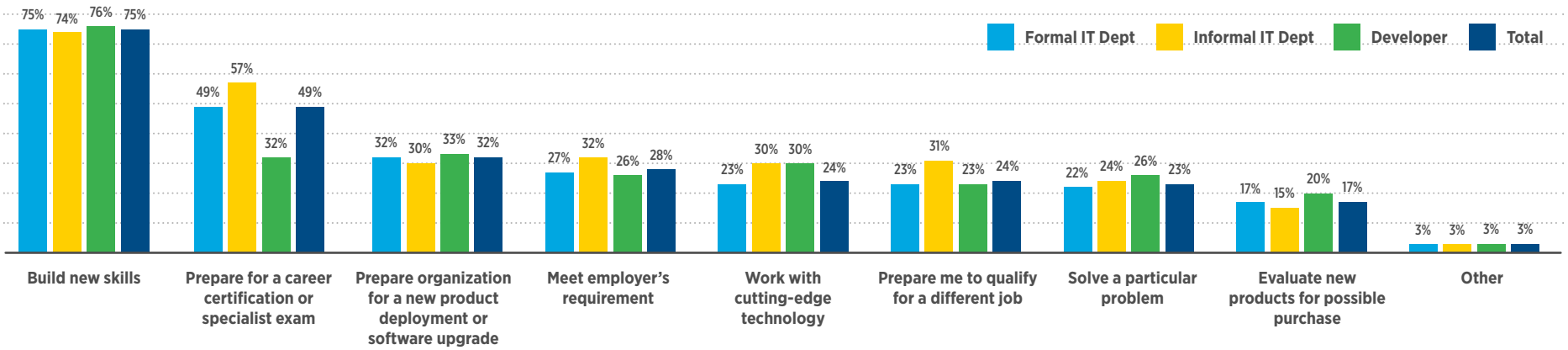
Of the respondents who pursued certification in the preceding year, 73 percent noted an increase in their job effectiveness because of related training. Fifty percent noted a slight increase and 23 percent reported a significant increase. Interestingly, ITDMs held a more favorable view of certification and related training. Eighty-six percent of those who sent their staff for such training noted at least a slight improvement in job effectiveness.

WHY PROFESSIONALS DON'T TRAIN

Not all of this year's respondents reported participating in professional development. Lack of an available training budget is the primary reason. In fact, over 45 percent of those who did not train said their organizations did not allocate funds for it. According to the ITDMs who responded, lack of training budget is also one of the driving reasons behind skills gaps in IT departments. We might expect this to be an issue solely for smaller organizations, but that percentage remains consistent across all employee groups, regardless of size or industry. Other reasons include work demands preventing time away from the office, lack of perceived benefit by management and an inability to travel for training purposes.

One-third of IT respondents indicated they can train only on an ad hoc basis or if a project requires specific skills. Twenty percent are limited to one course per year, while 31 percent reported being able to take four or more courses per year. Access to and support for training varies considerably across the respondent population and remains a major factor in determining whether employees participate in any sort of professional development activities.

REASONS FOR TRAINING (IT)

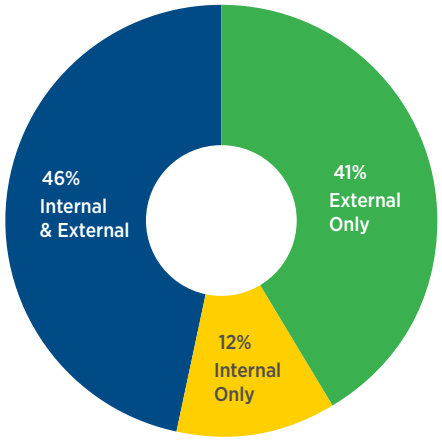


USING INTERNAL VERSUS EXTERNAL TRAINING RESOURCES

Organizations cover employee training needs both internally and externally. Internal resources include using company employees, such as human resources or learning and development staff, to train other employees; using internally developed and managed training materials; and purchasing third-party dedicated software or printed materials. External resources include online third-party training software; external trainers brought on-site; and outside training sessions, conferences and events that employees go to.

More than 85 percent of respondents reported using some form of external training, compared to 59 percent using internal resources. Given that organizations can use external, internal or a mix to meet their learning and development needs, it is not surprising to see a near majority (46 percent) of respondents using both. Just over 41 percent rely solely on external sources, while one out of eight IT respondents said their firms only use internal sources.

IT TRAINING RESOURCES



External third-party online training software, including virtual classes and online videos, and sending employees to outside training providers are the most frequently mentioned external resources used for training IT employees. Using company employees is the most popular internal method that organizations employ.

ANNUAL PROFESSIONAL DEVELOPMENT PLANS

Overall, 53 percent of respondents reported their organizations use annual planning that includes employee development. This skews upward for Canadian firms (58 percent) and slightly downward for U.S. firms (52 percent). There is a sizable difference between smaller and larger firms in their use of such plans. Forty-three percent of organizations with fewer than 100 employees use annual development plans, as compared to 60 percent of firms with 5,000 or more employees. Non-technical respondents are more likely to report using annual training plans in their organizations, compared to IT respondents (60 percent versus 52 percent).

What impact, if any, do these plans have on employee morale or satisfaction? Employees in organizations with training plans in place reported being less likely to leave their companies (78 percent versus 73 percent for those without a plan and 69 percent for those who were unsure if such plans exist). These employees are also less likely to report that employee turnover is an issue at their respective companies. The existence of an employee training and development plan was positively associated with the belief that an IT professional's contribution is valued by their managers and that certifications matter to the organization as a whole.

It may seem that formalized employee development is the domain of larger organizations, even though not all larger firms use an annual training plan for their staff. Yet, overall training plans appear to have merit because of their association with decreased turnover and creating a greater sense of employee commitment.

CERTIFICATIONS: HAS THE GOLD STANDARD BEEN DEBASED?

IT certifications are considered a gold standard for exhibiting knowledge learned, and by proxy, one's ability to perform on the job. However, are such certifications worth the time and the expense they require? Is it better to simply pursue skills as needed? After all, there are numerous low-cost, readily available ways to acquire usable information. In other words, what's the value proposition for certification?

Two trends support a contention that certification is more popular than ever and more appreciated and valued by the people who pursue them and by the people who hire them.

Among technical respondents, nearly nine out of 10 report having earned at least one professional certification during their careers. This is up 10 points from last year (87 percent versus 77 percent in 2015). This ranges from 77 percent for entry-level respondents up to 92 percent for IT professionals in executive roles.

Twenty-nine percent reported earning their most recent certification within the last six months.

What about current certification interest? Forty percent report they are currently working on a certification, up from 36 percent in the 2015 study. That said, only nineteen percent indicated having plans to start a new certification in 2016, down substantially from 26 percent last year. Also, over 40 percent reported that they have no plans to pursue certification in 2016, up slightly from 38 percent in 2015. Current enrollment or expressed plans to pursue a certification is highest for those early in their careers (67 percent) and declines to 44 percent for those in executive positions. Considering all of these various metrics, interest in certification appears to remain strong and growing slightly stronger, though immediate plans to pursue certification in the short term are down somewhat from previous years.

In addition, current or expected involvement with certification-related training varies by technical discipline. Overall, 59 percent of IT professionals are currently working on, or plan to pursue, some form of certification within the current year. This skews up for networking operations and engineering, cloud computing, and help desk, and it skews down for those in development positions, business analysis and project management.

CompTIA is the certification provider mentioned most frequently by respondents, with 35 percent of the certified IT professionals reporting they hold one or more CompTIA certifications. CompTIA certifications span numerous functional areas, including networking, security and project management. One in four certified respondents to this year's survey hold an A+ certification, one in five hold a Network+ certification and 17 percent hold a Security+ certification. CompTIA certifications are frequently foundational, so their average salary tends to be lower than other providers. However, two CompTIA certifications, Cloud Essentials and CompTIA Advanced Security Practitioner (CASP) trend above the average at $102,568 and $90,579, respectively.

Rounding out the top five certification categories are Cisco (2,595), security (2,332), Microsoft (2,327), and ITIL and IT service management (1,440). The average salary for Cisco certification holders is $82,746, compared to an average of $88,447 for all certified IT respondents.

IT professionals with experience and certifications in the IT security field are in strong demand. The ITDMs who responded said these candidates are at the top of their 2016 lists for talent recruitment. Average salaries within this category range from $81,316 for CompTIA Security+ to over $120,000 for (ISC)²'s Certified Information Security Manager (CISM) and ISACA's Certified in Risk and Information Systems Control (CRISC) and Certified Information Systems Security Professional (CISSP) variants. Security certifications also garner three of the top five salaries reported.

Nearly 2,600 IT respondents reported holding at least one Cisco certification and average holding two of them. Salaries range from $70,819 for Cisco Certified Entry Networking Technician (CCENT) to $121,578 for CCNP Data Center. Average salaries for CCNA-level certifications are in the mid-$80,000s. Presumably, higher-level Cisco certifications such as CCAr would trend even higher salary-wise, but we didn't receive enough responses from professionals holding those certifications to back up this assertion.

Over 2,300 respondents reported having at least one Microsoft certification, where over 50 percent indicated that they possessed one certification in that category. The Microsoft Certified Professional (MCP) received the most mentions with 41 percent of those holding a current Microsoft certification reporting that they have an MCP. As with other large vendors, there is a range of expertise levels and related salaries. Entry-level certifications such as the Microsoft Technology Associate (MTA) earn $66,608 on average. Salaries for certifications such as the MCP and the Microsoft Certified Solutions Associate (MCSA) are typically in the $80,000 range. IT professionals with more advanced certifications, including the MCSE and its variants, could easily earn in excess of $100,000.

MOST POPULAR CERTIFICATION CATEGORIES

Certification Category	Mean	Median	Count	Percent
Application Development	$91,248	$88,166	250	3%
Avaya	$89,667	$85,000	118	2%
Big data	$101,812	$90,000	53	1%
IT architecture	$111,404	$108,690	115	1%
Business process	$100,129	$95,000	277	4%
Business analysis	$103,051	$96,000	244	3%
Cisco	$82,746	$77,000	2,595	33%
Citrix	$90,846	$85,000	626	8%
Cloud	$119,238	$120,000	299	4%
CompTIA	$76,575	$70,910	2,688	35%
EMC	$96,568	$86,000	110	1%
Help desk	$71,104	$64,950	196	3%
Governance	$123,350	$119,000	214	3%
HP	$86,735	$83,250	156	2%
IBM	$95,944	$95,000	147	2%
Internet/Web development	$74,046	$69,000	283	4%
ITIL and IT service management	$98,212	$95,000	1,440	19%
Juniper	$94,975	$87,000	176	2%
Knowledge management	$87,530	$76,300	37	0%
Microsoft	$84,229	$80,000	2,327	30%
Networking	$85,509	$80,000	519	7%
Novell	$95,893	$87,500	229	3%
Oracle/Database	$95,911	$90,000	123	2%
Project management	$97,655	$94,100	892	11%
Red Hat / Linux	$90,538	$85,000	255	3%
SAP	$124,904	$118,000	34	0%
Security	$95,603	$91,306	2,332	30%
Sun	$106,009	$101,000	85	1%
VMware	$95,056	$90,000	681	9%
Virtualization	$102,696	$95,000	99	1%
Wireless	$90,510	$82,500	178	2%
Other certifications	$92,249	$89,000	836	11%

Professionals who have ITIL and IT service management certifications average $98,212, or 11 percent above the norm for certified respondents overall ($88,456). More than 90 percent of respondents in this category hold an ITIL Foundation, which has an average salary exceeding $98,000. The range for the category is not as high as others, but salaries for several of the more advanced certifications such as ITIL Service Lifecycle: Service Operation and ITIL Service Lifecycle: Service Transition exceed $117,000 on average.

Respondents said certifications have a positive impact on their earning potential—some more positive than others, as evidenced by this year's Top 20 Highest-Paying Certifications list. To be included in the list, a certification must have had at least 100 respondents.

In 2014 and 2015, security certifications held the top spot for salary. This year, the highest average salary ($131,443) goes to respondents holding ISACA's Certification in the Governance of Enterprise IT (CGEIT). Security certifications remain close behind with three of the top five slots occupied by CRISC, CISM and CISSP.

As computing technology's transition toward the cloud continues, so does the importance of skilled IT professionals who are needed to design, guide and implement this process. Training that leads to certification across the Amazon Web Services (AWS) portfolio helps build the skills needed to design, deploy and operate applications and infrastructure in the AWS environment. The AWS Certified Solutions Architect – Associate boasts an average salary of $123,801. Other cloud certifications show significant value too, including cloud computing credentials from VMware, Cisco, Citrix and Microsoft.

The Project Management Institute's PMP certification is never far from the top five. As IT and other projects continue to expand in scope and complexity, it is

TOP 20 HIGHEST-PAYING CERTIFICATIONS

Certification	Mean	Median	Count
CGEIT: Certification in the Governance of Enterprise IT	$131,443	$125,000	123
AWS Certified Solutions Architect - Associate	$123,801	$120,000	203
CRISC: Certified in Risk and Information Systems Control	$121,424	$120,000	274
CISM: Certified Information Security Manager	$121,177	$118,000	377
CISSP: Certified Information Systems Security Professional	$120,933	$117,000	589
CISA: Certified Information Systems Auditor	$112,931	$110,000	574
PMP: Project Management Professional	$112,153	$108,690	437
CCIE Routing and Switching	$109,656	$103,000	128
Citrix Certified Advanced Administrator – XenApp 6	$108,113	$100,000	133
Certified ScrumMaster	$107,080	$100,882	102
Citrix Certified Expert – Virtualization (CCE-V)	$106,496	$102,000	108
CCAdmin – XenApp 5	$105,242	$100,000	140
CCNA Data Center	$105,136	$96,000	155
Certified Business Analysis Professional	$105,045	$98,000	114
MCSE: Microsoft Certified Systems Engineer 2003	$105,013	$98,000	205
CCAdmin – XenDesktop 5	$103,534	$100,000	155
CCDP Cisco Certified Design Professional	$103,360	$97,700	175
CCNP Security	$102,832	$98,000	163
CEH: Certified Ethical Hacker	$102,482	$101,250	178
Six Sigma Green Belt	$101,550	$96,000	151

Certifications listed here had at least 100 responses. For a complete list of certifications by salary, see page 41.

critical to mission success for trained professionals to oversee their implementation. According to PMI Today, there are over 694,000 PMP-certified individuals worldwide. Salaries for PMP-certified professionals range from a median of $108,690 up to an average of $112,153. Obtaining this certification is often a pathway for technical professionals to move out of the trenches into roles offering expanded responsibilities with commensurate (and greater) compensation.

The remainder of the top 20 is from a diverse mix of disciplines. Citrix has four certifications on the list, including the Citrix Certified Expert in Virtualization (CCE-V). All earn between $101,000 and $108,000 on average. Between them, Cisco and Microsoft have five certifications on the list, including CCIE Routing and Switching and the MCSE on Windows Server 2003, a platform that reached end-of-life status in July 2015. Other categories represented include security (Certified Ethical Hacker), business analysis (Certified Business Analysis Professional), business process (Six Sigma Green Belt) and project management (Certified Scrum Master).

From the salary perspective there are a few additional certifications worth keeping an eye on. The COBIT certification, from ISACA, provides IT executives the essential guidance needed to govern their organization's IT activities. Average salary for COBIT holders typically falls in the range of $115,000 up to $123,000. The Cisco Design Associate (CCDA) provides a fundamental knowledge of network design to those who are expanding into networking roles. Average salary for holders of this certification is around $100,000. Those who require a working knowledge of Juniper networking systems and protocols can strive for the JNCIA-Junos and its average salary of $94,000. Finally, if Linux is important to your career path, then consider the Red Hat Certified Engineer (RHCE) whose average salary also pushes $100,000. For interested IT professionals, Red Hat offers an enterprise- and Linux-focused certification program that is both broad and deep.

SHOWING OFF YOUR BADGE

Digital badges are considered a validated indicator of one's skills and accomplishments. For example, AWS gives their certification holders the ability to exhibit the AWS Certified logo on LinkedIn, outbound emails and websites. Some of the functions of digital badges include a signal of achievement to potential employers, a means for motivating engagement and collaboration, and building a sense of identity within learning communities.

Only three out of 10 (31 percent) of IT respondents indicated some level of familiarity with the digital badge construct. Overall, 70 percent reported having no familiarity with the concept. Of those familiar, 59 percent have at least one badge.

Attitudes toward badging are moderate, with up to half of respondents expressing agreement with statements such as "Badges highlight and recognize the skills and knowledge that come from personal initiative," "Badges encourage peer-based assessment," and "Badges enhance my personal identity and reputation." The takeaway from these responses: If you plan to display a badge as part of your professional persona, you must also be prepared to answer questions about that badge and to explain its meaning and value.

HIGHER BAR, MORE VALUE FOR MICROSOFT CERTIFICATIONS

When Microsoft reinvented its MCSA and MCSE certifications in 2012, moving from Microsoft Certified Systems Administrators and Engineers to Microsoft Certified Solutions Associates and Experts, the company also raised the bar for achieving them. Becoming certified now requires passing more exams, and those exams are more rigorous—much more rigorous, according to the Microsoft instructors at Global Knowledge.

Previously, IT professionals would take one exam to become a Microsoft Certified Technology Specialist (MCTS) and then take two or three exams to achieve Microsoft Certified IT Professional (MCITP) status. Now, professionals on the path to an MCSE—the current road map's equivalent to MCITP—must first earn an MCSA that requires two to three exams and then pass two MCSE exams.

At the same time that the exams have become more challenging, the certification paths have grown longer, and more specialized paths have become available, we've noticed a decline in the number of survey respondents who are Microsoft-certified. We've also noticed a steady decline in the number of Microsoft certifications that make our Top 20 Highest-Paying Certifications list.

For a certification to be included on that list, at least 100 respondents must have provided salary data about it. So, just because a Microsoft certification isn't on our top-paying list doesn't mean we haven't heard from Microsoft-certified professionals who are bringing in list-worthy salaries. It simply means we haven't heard from enough of them.

Even without the required 100 responses, the data we've collected suggests that while it may take longer to earn an MCSE certification, the pursuit pays off. In fact, some MCSE specializations are bringing in salaries that rival those of even the highest-paying certifications on our list. So, raising the bar for Microsoft certifications may have made them a little less common among the respondents to this survey, but it also appears to have increased their value.

Construction on the Microsoft certification road map is far from over. Further refinements are sure to follow the upcoming releases of Windows Server 2016, Exchange 2016 and SQL Server 2016. In fact, those pending releases could be another factor in the declining certification rate, as professionals wait to certify on the latest and greatest.

As Microsoft Azure expands access to other operating systems and platforms, and as Azure expertise becomes required for partner's cloud certifications, the frequency and value of Azure certifications will certainly grow. Also, perhaps the recent additions to the developer path will result in more professionals attaining MCSD certification, the developer equivalent of MCSE.

Year	IT Respondents	Total Certified	Microsoft-Certified	Microsoft Certs in Top-Paying 20
2013	10,068	8,356 (83%)	4,447 (54% of all certified)	8
2014	10,299	7,518 (73%)	2,462 (33% of all certified)	4
2015	9,611	7,400 (77%)	2,173 (35% of all certified)	3
2016	8,923	7,763 (87%)	2,327 (30% of all certified)	1

Certification	Year	Count	Median Salary
MCSE: Data Platform	2013	0	—
	2014	11	$118,191
	2015	12	$92,364
	2016	12	$131,172
MCSE: Messaging	2013	0	—
	2014	93	$99,824
	2015	49	$95,559
	2016	48	$119,016
MCSE: Private Cloud	2013	24	$89,149
	2014	29	$92,599
	2015	30	$94,919
	2016	30	$108,779
MCSE: Server Infrastructure	2013	88	$86,600
	2014	85	$94,747
	2015	64	$93,267
	2016	85	$104,851

PERSPECTIVE:

IT DECISION-MAKERS

Whenever you see a successful business, someone once made a courageous decision.

— PETER F. DRUCKER

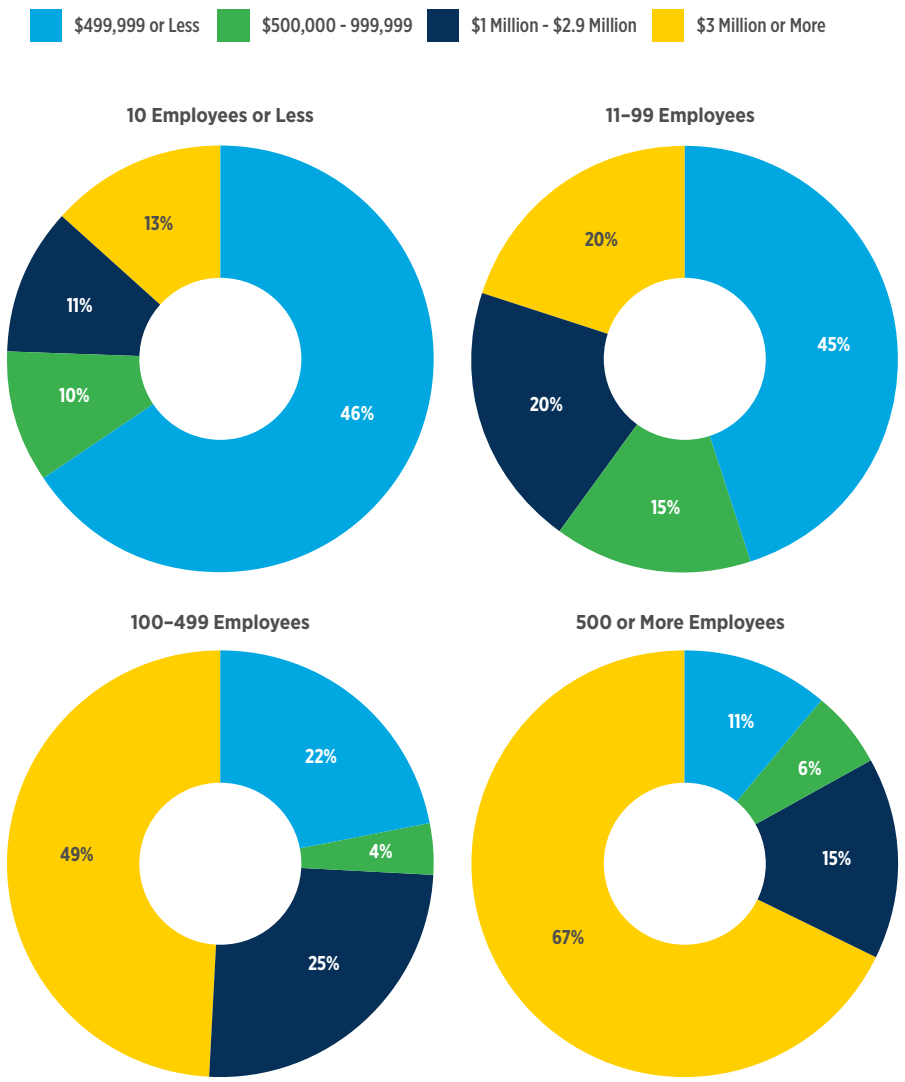
There is no lack of courageous decisions to be made by those tasked with running an organization. This applies equally to those who manage a four-person help desk team up to those charged with stewarding entire organizations. In this year's survey, we asked ITDMs a select set of questions aimed at assessing their staff training needs and the impact, if any, skills gaps are having on their ability to accomplish their business missions.

One out of four IT respondents (28 percent or N = 2,521) hold a position of responsibility. This skews up to 30 percent for U.S. respondents and down to 21 percent for Canadian respondents. Nearly nine out of 10 are male, with over 60 percent having invested 16 or more years in their careers. Over half (56 percent) manage teams and operations in IT security, network engineering, systems engineering or IT architecture. Half manage teams of up to 10. At the other end of the spectrum, 18 percent are responsible for teams exceeding 100 full-time employees.

DEPARTMENT SIZE AND BUDGET ALLOCATIONS

The budget ranges, which exclude salaries, are consistent with the reported staff sizes. In one corner, two-thirds of the smallest teams have budgets under $500,000, with the majority of this group having a budget under $250,000. In the other corner, two-thirds of the largest teams have budgets exceeding $3 million. Half of those responding expect to see their staff and technology budgets increase this year (ranging from 44 percent for the smallest organizations up to 60 percent for those with 500+ staff). Typical increases will be one to five percent. Overall, one-third expect their budgets to be flat, with the remaining 17 percent expecting a decrease in available funding.

IT BUDGET BY STAFF SIZE



SKILLS ASSESSMENT

We asked respondents to candidly assess their teams' skills and how, if at all, skills gaps affect performance. Thirty-eight percent reported they are prepared today and for two years out. This is up six points over last year. Of those who indicated training is available, 41 percent reported no skills gaps, compared to 34 percent of those who said formal training is not available to their teams.

Skills Gaps	2016	2015
There is a lack of skills today.	31%	36%
We have the skills needed today but are concerned about the next 12 to 24 months.	31%	32%
We have the skills needed for today and for the next 12 to 24 months.	38%	32%

We asked respondents who indicated they have a current deficit or expect to have one within a year or two about the causes of and impacts expected from the shortage. The primary causes include a lack of training investment (44 percent) and the inability to attract skilled talent to a specific industry. Respondents leading smaller and mid-size IT organizations attributed the gaps to lack of training investment more frequently than did respondents leading larger teams. However, leaders of larger teams reported having a more difficult time attracting talent to their specific industry (59 percent of respondents managing teams of 500+ compared to 41 percent of those with 10 or fewer members). Other key reasons for skills gaps include an inability to pay what applicants are asking—more often a concern for smaller IT shops—and a perceived lack of qualified candidates.

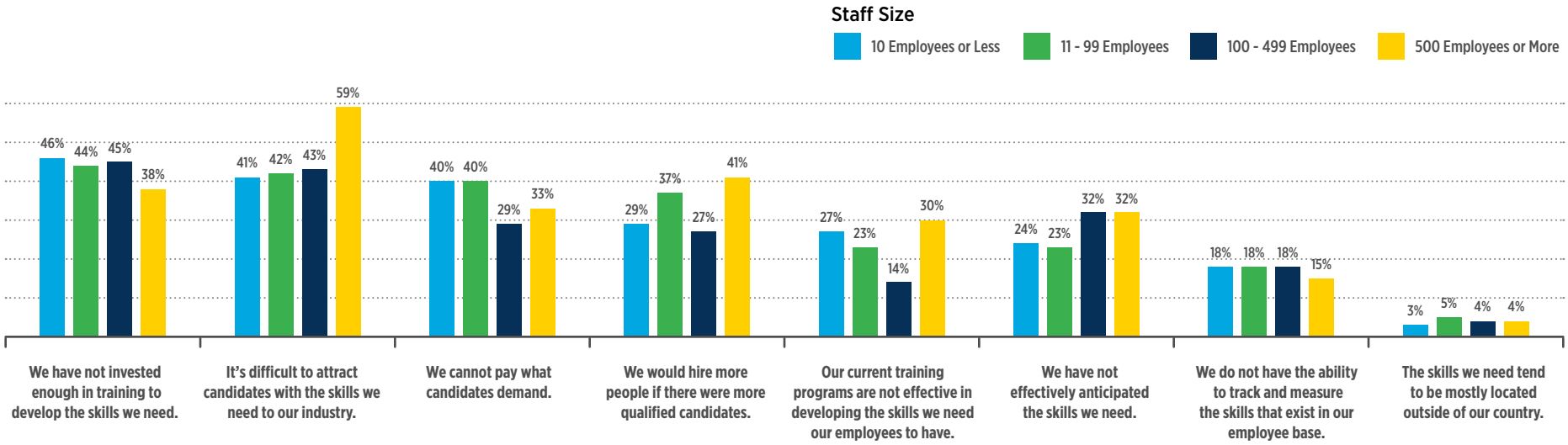
Whatever the causes, skills gaps have a strong impact on a technology organization's ability to fulfill its mission and can decrease the whole company's ability to compete. Respondents who reported skills gaps noted several key impacts on their operations. Chief among them is increased stress levels for existing employees who are trying to do more with less, followed by declining quality and delayed deployments.

Which skill clusters are ITDMs having the most difficult time filling? Over 70 percent of the ITDMs responding indicated they are having difficulty filling positions in IT security, IT architecture, cloud computing, network engineering and .NET development.

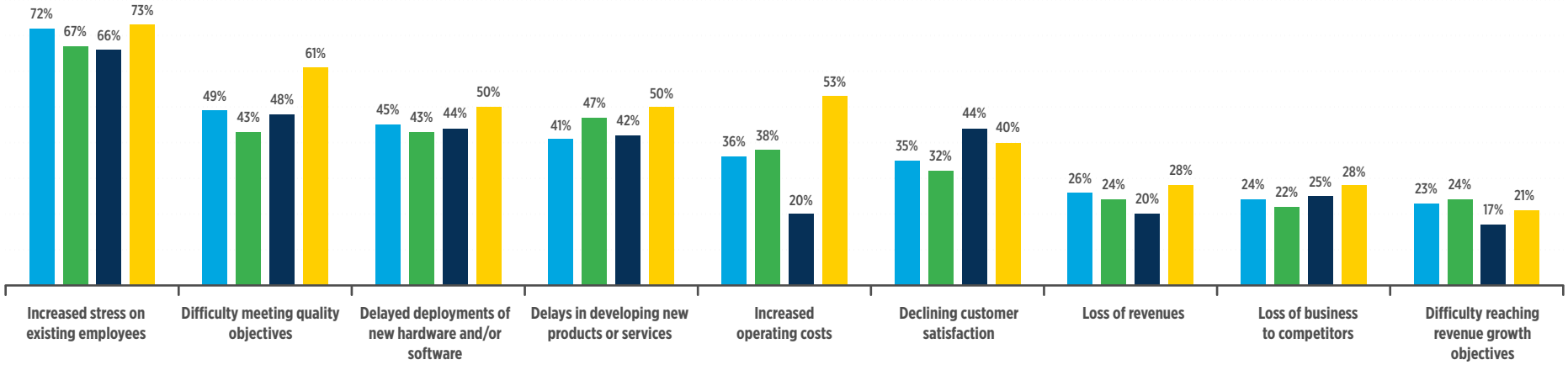
DIFFICULT AREAS TO FILL

Area	ITDMs Reporting
IT security	37%
IT architecture	26%
Cloud computing	22%
Network engineering	22%
.NET development	16%
Business analysis	16%
Core skills: Communication, management, leadership	16%
IT service management	16%
Network operations	16%
Systems engineering	16%
Database management/development	13%
Help desk	13%
Business application development	12%
Business technology	12%
Enterprise infrastructure management	12%
Data warehousing / Business intelligence	11%
Project/Program management	11%
Storage/SAN	10%
System operations	10%
Mobile apps development	9%
Strategic planning	9%
Voice engineering	9%
E-commerce/E-business	8%
Java development	8%
Web/Intranet/Extranet	7%
Sales and marketing	6%
Enterprise messaging	5%
SAP	5%
Six Sigma	5%
Social networking	4%
Finance	3%

REASONS BEHIND SKILLS GAPS



IMPACT OF SKILLS GAPS ON THE ORGANIZATION



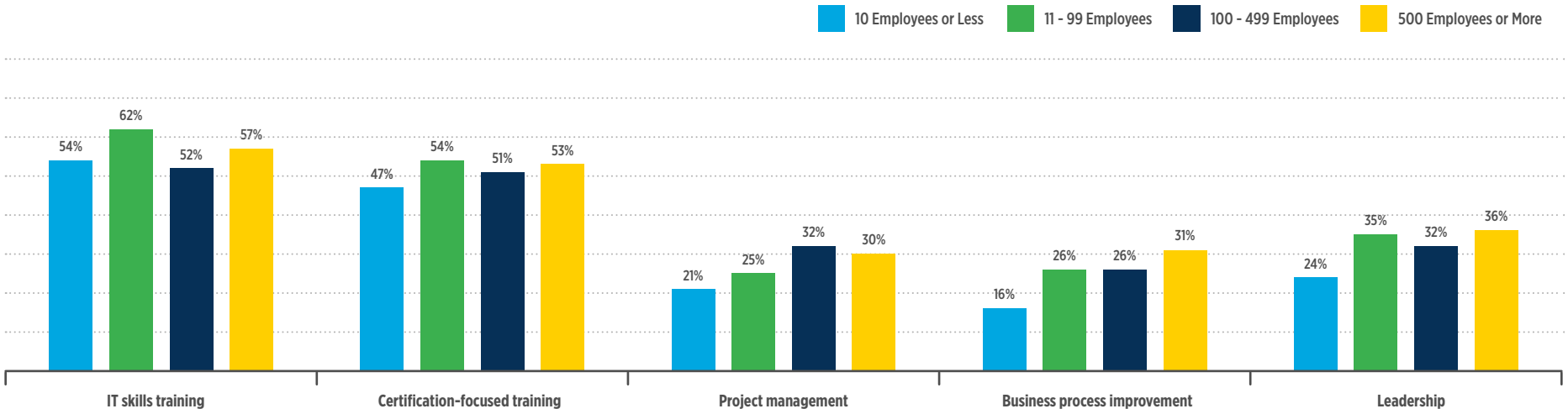
IS TRAINING NECESSARY?

Six out of 10 ITDM respondents reported that their team members receive company-provided training. At 52 percent, the ratio is lowest for organizations with 10 or fewer staff and up to 71 percent for IT organizations with 500 or more staff. For respondents whose organizations offer training, 70 percent have sent their team members to outside training providers of one kind or another.

Certification-focused training was on the docket for over two-thirds of the ITDMs who had staff trained. Over two-thirds authorized training for certification or recertification (65 to 74 percent, depending on staff size). The general perception of these managers is that staff who are certified bring added value to the organization. When it comes to job effectiveness, one out of four (25 percent) noted a significant increase in performance post-certification. Over 60 percent reported seeing at least a moderate increase in the effectiveness of their staff after gaining certifications.

Looking forward, ITDMs definitely see training as important to mitigating the skills gaps they now face. Skills development is at the top of the list, with over 57 percent reporting a high likelihood of pursuit. Larger organizations are apt to have a diversified workforce and are more likely to embrace training in the areas of project management, business process improvement and leadership development.

LIKELIHOOD FOR TRAINING IN 2016



PERSPECTIVE:

APPLICATION DEVELOPERS

It's kind of fun to do the impossible.

— WALT DISNEY

There is no denying we live in an application-centric world. According to the online statistics portal Statista, as of June 2015 more than 100 billion mobile apps have been downloaded from the Apple App Store alone, not to mention downloads from Google Play, the Microsoft Store and other similar outlets. The app market has expanded from primarily productivity and informative tools, such as calendars, email and weather apps, to products that support leisure activities, including games, entertainment and education.

Once only the domain of mobile browsers, the world of mobile software is being overtaken by mobile apps. Consider for example, the category of mobile social networking properties. It includes Facebook with its monthly 700 million plus active mobile-only users and represents one of the largest online communities worldwide. There is also a strong growth trend in mobile retail thanks to shopping apps. All in all, application development has become a gargantuan business—not just for mobile devices, but also for laptops and other electronic gadgetry.

To get a sense of what's going on in this booming field, in this year's survey, we included a separate question set specifically for developers, including business application developers, Java developers, .NET developers, mobile app developers and web/intranet/extranet developers. Developers account for six percent of the North American respondents (N = 620). Eighty percent of those respondents are male, entirely in line with the larger overall set of IT respondents. The largest group (45 percent) are in mid-level roles, with an average of 11 to 15 years of tenure in their careers.

WHAT TOOLS ARE IN THEIR TOOLKITS?

On average, developers employ five tools to get their work done. Languages and database tools are the leaders in the app development space. Integrated development environments, version control procedures and bug-tracking tools round out the top five. All of these items are essential to developing, testing, releasing and maintaining quality software.

Seventy percent of those in development roles use one or more programming languages. On average, developers use six different languages to accomplish their tasks. More than 60 percent of the developers who responded said they use JavaScript, SQL and some version of HTML. XML, Java, .NET and CSS round out the top of the list. Thirteen languages are used by at least 10 percent of the developers responding. The tools with fewer mentions include Ruby, Objective-C, COBOL, RPG, Python and Visual Basic.

On average, the developers who responded are involved in two areas of software development. Nearly two-thirds (65 percent) are involved in business application development, and more than 60 percent include web development in their list of tasks. Half are involved in system development.

APPLICATION DEVELOPERS' TOOLS OF THE TRADE

Tool	
Languages	70%
Database tools	70%
Integrated development environments	57%
Version control	56%
Bug tracking	51%
Framework	50%
Storage	44%
Project management tools	40%
Web hosting	37%
Website analytics	25%
Other	3%

CRITICAL LANGUAGES

Language	
JavaScript	67%
SQL	66%
HTML	62%
XML	48%
Java	46%
.NET	43%
CSS	42%
C#	33%
Python	27%
ASP	21%
C/C++	21%
PHP	18%
Perl	10%

SOFTWARE DEVELOPMENT

Areas	
Business applications	65%
Web development	61%
Systems development	51%
Test automation	31%
Mobile applications	28%
Embedded systems development	14%
Scientific development	5%
Other	3%

We asked the developers who responded to share their thoughts on the trends shaping their work. Security concerns are top of mind. According to one respondent, “Security, Security, Security. With all the hacking of company systems, every level of an IT department needs to be aware of how they can do their jobs better and make their code or the systems they administer more secure.”

Other developers focused on the continued shift toward development for mobile applications. This is a natural outgrowth of burgeoning Internet of Things activity, with more networking things to interact with and manage. Many developers mentioned cloud computing in all of its many manifestations. As one respondent reported, “Cloud services will eventually take most of the repetitive effort out of building software.”

From a skills perspective it is apparent that to be successful in the development world, one needs to be able to bridge multiple platforms. Respondents reported seeing increasing use of HTML5, Python and Angular JS. According to one developer from New York, “To be successful you need to stay aware of technological changes, maintain a base-level knowledge of secondary skills and [understand] how different technologies integrate.”

Several respondents emphasized the need for fluency in multiple languages, or at the very least an ability to pick up new programming languages quickly. Flexibility and adaptability are key attributes for anyone who wishes to be successful in a software development role of some kind.

PERSPECTIVE:

NON-IT PROFESSIONALS

Yesterday's home runs don't win today's games.

— BABE RUTH

Although most non-IT professionals do not see training and certification in the same light as those in technology do, there is no doubt that both are important to career development and advancement. As the foregoing quote from the Babe reminds us, what we learned yesterday may have worked then, but we must keep our eyes on what is ahead if we are to succeed in the days and years to come. Non-IT professionals, especially those outside accredited professions, such as law, engineering, and accounting, need to keep their skills fresh to stay competitive and help their organizations compete.

More than 1,200 professionals from fields as diverse as accounting to strategic planning responded to a slate of questions on professional development, certification and workplace challenges. The non-IT respondent is markedly different from his or her technology counterpart. Non-IT respondents are more apt to hold a graduate degree (33 percent versus 19 percent), to be female (44 percent versus 18 percent), to be more tenured in their careers, and to manage both staff and budget.

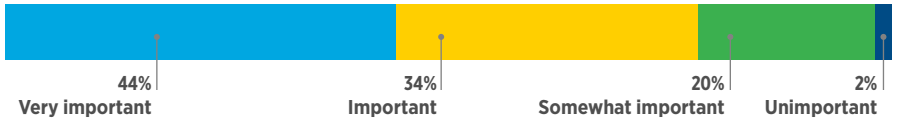
A certification equating to expertise is less common outside the tech world, though there are some notable exceptions, such as project management, accounting, law and financial planning. Yet, non-tech professionals still place value on professional development. Overall, 78 percent rated professional development as important or very important in the context of their current career stages. As with tech professionals, training for new skills and/or certification varies by tenure. It's important or very important for 87 percent of those with five or fewer years under their belt versus 72 percent of those with over 20 years of experience.

Over 80 percent reported they would likely undertake training of some form in 2016. Over half of those responding said they have plans to work toward some level of professional certification.

Respondents reported needing training in several areas. Topping the list are skills that foster effective communication and the ability to interact with superiors, peers and subordinates, followed by leadership and risk management skills.

Perceptions of which skills to improve upon is a function of both internal reflection and an awareness of what is happening in the organization. From the perspective of workplace challenges, respondents said internal communication is the most relevant, followed by needing to lead without authority and unclear job roles and responsibilities. The latter point is no doubt driven by the change that comes from the process of flattening an organization or growth through mergers and acquisitions. Above all, this points to the need for individual contributors to be able to collaborate well with others and to persuade, encourage and cajole their co-workers into helping them meet organizational objectives, with or without the mantle of a formal leadership or management position.

IMPORTANCE OF PROFESSIONAL DEVELOPMENT



KEY TRAINING AREAS

Area	Percent
Communication skills	48%
Interpersonal skills	42%
Leadership	42%
Risk management	41%
Presentation skills	39%
Process improvement	39%
Team building	38%
Training and development	38%
Change management	37%
Thinking and innovation	37%
Time management	37%
Management and supervisory skills	36%
Project/Program management	36%
Strategic planning	35%
Business analysis	34%
Business intelligence	30%
Customer service	28%
Predictive analytics and data mining	28%
Business enhancement skills	27%
Business writing	25%

WORKPLACE CHALLENGES

Area	Percent
Communication within organization	52%
Leading without authority	39%
Unclear job roles and responsibilities	39%
Working with remote teams	37%
Collaborating with teams	36%
Working across borders and cultural differences	24%
Managing budget resources	24%
Working with supervisors	20%
Other	5%
None	8%

LOOKING FORWARD

Success is where preparation and opportunity meet.

— BOBBY UNSER

IT security is the technology area most likely to expand in 2016, followed by cloud initiatives and IT architecture. In fact, more than 40 percent of the IT respondents, both staff and decision-makers, reported that their organizations expect to increase security efforts this year. This is consistent across company size, industry and geography and shows how important security is to organizations of all sizes and stripes, no matter how they earn their keep or what kind of objectives they're seeking to meet.

The percentage of respondents who reported that IT and business projects are resuming or being initiated has held steady over the last four years (in the mid-70 percent range). In this year's survey, one-third reported a slight increase in projects, with 30 percent indicating a moderate increase and 14 percent reporting a significant increase.

The percentage of respondents who indicated that their organizations are facing challenging conditions or reported that conditions are "the worst ever" increased to 49, up from 44 percent in the 2015 study. Over 28 percent of respondents reported that their organizations are in environments where business conditions are either significantly improving or where "business is good." This has remained stable over the last four years as well. One in four reported they are in slow-growth mode. Firms that see their business conditions as good or significantly improving are more apt to pursue new technical and business projects. They are also more likely to invest in training for their technical employees.

TECHNOLOGY AREAS OF INTEREST FOR 2016

CONCLUSIONS

Success is nothing more than a few simple disciplines, practiced every day.

— JIM ROHN

What factors have the greatest impact on project success? We asked respondents to rank five: team skill, team effort, project leadership, vendor support and other factors. Forty-three percent of respondents, ranging from 37 percent for decision-makers to 54 percent for non-technical professionals, ranked project leadership most important. Team skill and team effort tied for second.

What is clear is that organizations are willing to invest in personnel and the technology they need to better themselves in the market. Agility is the watchword for today. Trends such as costly security threats and the promise of a better, or at least more connected, world arising from the Internet of Things require companies to maintain an agile stance if they seek to remain competitive. The power that IT and business professionals have to influence this process is the value they bring to the table through ongoing knowledge and skills development. It is this artful combination of resources and employee ingenuity that enables organizations to stay relevant and competitive.

New skills not only add to one's acumen, but also open doors for advancement and enable professionals to better their economic potential. Certifications are still seen as valuable within professional communities served by IT and non-IT professionals. This trend is unlikely to change as the pace of technological innovation and market forces continue to demand that we develop new ways of thinking and executing.

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ABOUT THE PRIMARY RESEARCHER

Greg Timpany is the senior manager for market research and competitive intelligence at Global Knowledge. He has more than 25 years of experience in market research, competitive intelligence and database marketing. His experience includes research design and implementation for both consumer and B2B segments. He is also a published author and lecturer focusing on the effective use of marketing data. Greg has held positions with Guitar Center, Los Angeles Times and Wilkin Guge Marketing. He holds an MBA in information systems and marketing from California State University, San Bernardino.

THANKS TO OUR PARTNERS

Global Knowledge extends a special thank you to our partners for helping make this year's survey possible:

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Microsoft
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COMPLETE LISTS OF SALARIES BY CERTIFICATION AND STATE/PROVINCE

To ensure the integrity of the information we provide, for a certification to appear in our "highest-paying" and "most popular" lists, we require that it has data from at least 100 respondents. The lists below do not have that requirement and are for information purposes only. The fewer responses a certification receives, the less reliable the data, so use your judgment when drawing conclusions.

SALARIES BY CERTIFICATION

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
Application Development	Certified Scrum Developer (CSD)	$98,931	$98,500	16	$99,500	$105,000	4
	Certified Software Development Associate (CSDA)	$38,000	$38,000	1	—	—	0
	Certified Software Development Professional (CSDP)	$131,200	$131,200	1	$67,274	$81,000	5
	Development Certifications through Colleges and Universities	$75,821	$81,180	35	$84,935	$81,000	10
	Java ME Mobile Application Developer	$78,490	$65,500	12	$84,908	$88,332	5
	JBoss Certified Application Administrator (JBCAA)	$98,650	$104,800	4	—	—	0
	MCSD: Web Applications	$94,300	$88,000	37	$64,130	$64,130	1
	MCSD: Windows Metro Style Apps Using C#	$99,367	$94,000	15	$81,400	$81,400	2
	MCSD: Windows Metro Style Apps Using HTML 5	$84,875	$92,250	4	—	—	0
	MCSD: Windows Store Apps	$90,630	$94,000	9	$61,600	$61,600	1
	Microsoft Certified Professional Developer (MCPD)	$93,891	$89,600	39	$76,734	$86,265	6
	Mobile App Security+	$94,114	$105,000	14	$86,070	$86,070	2
	MTA: Mobile Development Fundamentals	$76,632	$69,000	10	—	—	0
	Oracle Application Express (APEX) Developer Certified Expert	$90,794	$93,087	4	$41,535	$41,535	2
	Oracle Certified Associate (OCA), Java	$94,316	$82,500	36	$88,300	$95,000	4
	Oracle Certified Expert (OCE), Java	$107,945	$95,000	11	—	—	0
	Oracle Certified Master (OCM), Java	$98,750	$90,000	8	$106,200	$100,000	5

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	Oracle Certified Professional (OCP), Java	$107,885	$102,500	35	$96,889	$95,000	9
	Professional Scrum Developer I (PSD 1)	$96,925	$96,925	1	—	—	0
	Professional Software Developer (PSD)	$84,000	$84,000	1	$71,530	$81,000	5
	Salesforce Certified App Builder	$124,210	$100,000	8	$93,900	$93,900	2
	Salesforce Certified Platform Developer I	$73,000	$73,000	4	$94,760	$96,000	5
	SAP Certified Development Associate	$76,000	$82,000	6	$95,933	$96,000	3
	Other Application Development	$91,608	$90,000	36	$85,350	$76,800	8
Avaya	Avaya Certified Implementation Specialist (ACIS)	$88,211	$82,400	47	$88,333	$84,000	6
	Avaya Certified Support Specialist (ACSS)	$88,765	$86,000	43	$92,117	$72,000	12
	Avaya Implementation Professional Specialist (AIPS)	$96,647	$97,000	17	$81,194	$90,000	9
	Avaya Support Professional Specialist (ASPS)	$98,755	$81,000	11	—	—	0
Big Data	Cloudera Certified Administrator for Apache Hadoop (CCAH)	$87,332	$89,820	13	$85,600	$80,000	3
	Cloudera Certified Developer for Apache Hadoop (CCDH)	$130,786	$130,000	14	$84,200	$80,000	4
	Cloudera Certified Specialist in Apache Hbase (CCSHB)	$126,833	$90,000	3	$68,560	$80,000	5
	Other Big Data	$107,240	$105,000	15	$70,706	$71,513	4
IT Architecture	Cisco Business Value and IT Roadmap Specialist	$83,118	$85,000	11	$86,024	$90,525	3
	Cisco Business Value Practitioner	$110,644	$103,100	16	$96,175	$87,263	6
	Cisco Business Value Specialist	$105,429	$105,600	26	$85,212	$87,263	10
	Cisco Transformative Architecture Specialist	$123,907	$110,000	15	$104,431	$95,263	8
	TOGAF 9.1	$121,390	$120,000	47	$111,890	$108,690	25
	Other Business Architecture	$132,794	$135,368	11	—	—	0
Business Process	Six Sigma Black Belt	$105,600	$93,000	25	$95,231	$90,525	15

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	Six Sigma Green Belt	$102,594	$96,000	112	$98,551	$96,000	39
	Six Sigma Master Black Belt	$97,709	$96,000	17	$90,982	$96,000	13
	Other Business Process	$97,602	$94,000	49	$99,235	$96,000	17
Business Analysis	Certification of Competency in Business Analysis	$96,608	$95,500	30	$86,930	$75,000	7
	Certified Business Analysis Professional (CBAP)	$105,228	$98,000	83	$104,557	$96,800	31
	PMI Professional in Business Analysis	$112,072	$114,000	44	$101,161	$81,600	10
	Other Business Analysis	$104,482	$94,600	36	$89,161	$85,200	25
Cisco	CCIE Collaboration	$122,161	$141,000	14	$73,621	$74,742	4
	CCIE Data Center	$119,912	$110,000	38	$92,109	$90,000	7
	CCIE Routing and Switching	$112,858	$111,000	103	$96,463	$82,500	25
	CCIE Security	$95,176	$99,200	74	$97,633	$93,263	10
	CCIE Service Provider	$182,000	$190,000	5	$89,800	$76,000	4
	CCIE Voice	$109,104	$105,000	41	$70,137	$85,200	7
	CCIE Wireless	$96,406	$83,500	30	$97,200	$96,000	5
	CCNA Cloud	$112,865	$120,000	13	$64,284	$64,284	1
	CCNA Collaboration	$87,241	$80,000	37	$52,332	$52,332	2
	CCNA Data Center	$107,045	$100,000	134	$92,954	$86,261	21
	CCNA Industrial	$86,850	$80,000	6	$66,449	$63,313	6
	CCNA Routing and Switching	$79,942	$75,000	1,547	$78,831	$75,000	187
	CCNA Security	$85,598	$82,000	413	$96,328	$92,600	36
	CCNA Service Provider	$112,972	$120,000	9	$50,162	$50,162	1
	CCNA Video	$86,425	$80,000	38	$61,588	$61,825	4

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	CCNA Voice	$89,889	$85,000	267	$77,491	$69,225	53
	CCNA Wireless	$90,901	$85,000	159	$88,073	$82,140	24
	CCNP Cloud	$88,143	$65,000	7	—	—	0
	CCNP Collaboration	$109,389	$113,500	18	$112,500	$124,250	4
	CCNP Data Center	$123,444	$115,000	57	$108,283	$88,130	8
	CCNP Routing and Switching	$95,881	$92,000	501	$89,195	$82,520	78
	CCNP Security	$101,414	$98,000	145	$114,255	$105,600	18
	CCNP Service Provider	$102,872	$76,500	18	$134,400	$145,200	3
	CCNP Voice	$95,060	$90,800	128	$93,439	$90,000	29
	CCNP Wireless	$115,375	$103,500	48	$96,000	$93,000	6
	Cisco Certified Design Associate (CCDA)	$99,946	$93,250	242	$102,675	$90,000	33
	Cisco Certified Design Expert (CCDE)	$94,743	$83,000	44	$71,956	$65,845	7
	Cisco Certified Design Professional (CCDP)	$105,008	$99,000	146	$95,061	$90,000	29
	Cisco Certified Entry Networking Technician (CCENT)	$70,698	$65,000	753	$72,217	$65,000	65
	Other Cisco	$87,772	$79,000	75	$84,765	$80,000	12
Cloud	AWS Certified Developer – Associate	$126,210	$130,000	51	$93,192	$99,400	6
	AWS Certified DevOps Engineer – Professional	$130,284	$135,000	19	—	—	0
	AWS Certified Solutions Architect – Associate	$125,871	$120,000	187	$99,609	$97,124	16
	AWS Certified Solutions Architect – Professional	$126,546	$120,000	35	$110,000	$110,000	2
	AWS Certified SysOps Administrator – Associate	$122,735	$120,000	67	$79,033	$73,275	6
	Cloud Business Associate	$87,240	$110,000	5	$63,999	$49,750	5
	Cloud Technology Associate	$79,601	$70,000	15	$66,416	$64,125	6

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	CompTIA Cloud Essentials	$104,974	$107,500	24	$109,200	$109,200	2
	Professional Cloud Administrator	$95,111	$82,000	9	$96,800	$96,800	2
	Professional Cloud Developer	$154,000	$154,000	2	$96,800	$96,800	2
	Professional Cloud Security Manager	$158,333	$90,000	3	—	—	0
	Professional Cloud Service Manager	$150,000	$150,000	2	$108,900	$108,900	4
	Professional Cloud Solutions Architect	$179,117	$200,000	3	—	—	0
	Other Cloud	$136,000	$136,000	2	—	—	0
CompTIA	A+	$72,546	$65,000	1611	$75,243	$70,455	238
	CASP	$90,579	$81,000	42	—	—	0
	Cloud Essentials	$102,568	$100,000	33	$71,467	$85,200	3
	Healthcare IT Technician	$77,934	$69,000	33	$87,000	$87,000	2
	IT Fundamentals	$74,371	$65,000	98	$72,395	$70,910	15
	Mobile App Security+	$93,622	$84,800	9	$96,300	$96,300	2
	Mobility+	$79,579	$80,000	19	$75,817	$77,836	5
	Network+	$74,828	$68,000	1293	$73,477	$69,225	115
	Project+	$76,279	$70,000	247	$83,601	$80,918	16
	Security+	$81,467	$75,000	1216	$79,246	$74,400	89
	Server+	$82,918	$72,000	117	$76,522	$71,000	35
	Storage+	$92,823	$73,000	22	$100,500	$96,300	6
	Other CompTIA	$80,970	$70,000	85	$73,040	$66,000	4
Citrix	Citrix Certified Administrator (CCA) for XenApp 5	$107,561	$103,000	119	$92,100	$88,000	21
	Citrix Certified Administrator (CCA) for XenApp 6	$95,192	$88,500	270	$81,689	$72,000	45

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	Citrix Certified Administrator (CCA) for XenDesktop 5	$104,174	$100,000	136	$98,951	$94,600	19
	Citrix Certified Administrator (CCA) for XenServer 6	$103,696	$100,000	131	$84,159	$79,750	18
	Citrix Certified Advanced Administrator (CCAA) for Citrix XenApp 6	$110,002	$100,000	118	$93,247	$94,600	15
	Citrix Certified Associate – Networking (CCA-N)	$101,991	$100,000	73	$104,853	$94,600	13
	Citrix Certified Associate – Virtualization (CCA-V)	$92,527	$87,000	162	$98,917	$90,600	29
	Citrix Certified Enterprise Engineer (CCEE)	$108,362	$103,000	81	$106,608	$108,000	8
	Citrix Certified Expert – Virtualization (CCE-V)	$107,710	$102,000	97	$95,788	$85,092	11
	Citrix Certified Integration Architect (CCIA)	$110,225	$103,000	67	$123,052	$121,000	5
	Citrix Certified Professional – Mobility (CCP-M)	$94,992	$86,500	48	$83,000	$83,000	1
	Citrix Certified Professional – Networking (CCP-N)	$99,050	$100,000	80	$125,600	$121,000	6
	Citrix Certified Professional – Virtualization (CCP-V)	$102,138	$100,000	117	$94,082	$91,960	17
	Other Citrix	$92,977	$100,000	22	$103,632	$95,000	3
EMC	EMC Cloud Architect (EMCCA) Specialist – Virtualized Infrastructure	$162,313	$161,000	8	$71,000	$71,000	1
	EMC Cloud Infrastructure and Services Associate (EMCCIS)	$112,000	$112,000	2	—	—	0
	EMC Information Storage Associate (EMCISA)	$95,037	$92,000	41	$102,085	$87,500	9
	EMC Storage Administrator (EMCSA) Expert – CLARiiON Solutions	$109,914	$95,000	7	—	—	0
	EMC Storage Administrator (EMCSA) Specialist – Backup and Recovery – Avamar	$96,813	$90,500	12	—	—	0
	EMC Storage Administrator (EMCSA) Specialist – Backup and Recovery – NetWorker	$99,205	$84,910	4	—	—	0
	EMC Storage Administrator (EMCSA) Specialist – CLARiiON Solutions	$106,929	$105,000	7	$140,000	$140,000	2
	EMC Storage Administrator (EMCSA) Specialist – Network Attached Storage (NAS)	$89,250	$80,000	4	$65,845	$65,845	2
	EMC Storage Administrator (EMCSA) Specialist – Storage Area Network (SAN)	$90,957	$81,700	14	—	—	0
	EMC Storage Administrator (EMCSA) Specialist – Storage Management – ControlCenter	$107,500	$107,500	2	$109,200	$109,200	2

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	EMC Storage Administrator (EMCSA) Specialist – Symmetrix Solutions	$93,750	$80,000	4	—	—	0
	EMC Storage Administrator (EMCSA) Specialist – VNX Solutions	$101,369	$96,000	24	$86,910	$87,500	5
	Other EMC	$109,367	$100,000	15	$95,000	$95,000	1
Governance	Certified in the Governance of Enterprise IT (CGEIT)	$130,199	$125,000	97	$136,085	$125,550	26
	COBIT	$124,759	$120,000	70	$119,312	$100,000	24
	Other Governance	$82,039	$83,000	14	$96,566	$108,000	3
Help Desk	HDI Desktop Support Manager (HDI-DSM)	$82,283	$72,000	34	$85,103	$83,811	16
	HDI Desktop Support Technician (HDI-DST)	$69,337	$60,500	74	$73,838	$67,698	22
	HDI Problem Management Professional (HDI-PM)	$111,791	$105,975	8	$60,054	$62,804	4
	HDI Support Center Analyst (HDI-SCA)	$64,141	$57,475	44	$65,637	$60,000	8
	HDI Support Center Director (HDI-SCD)	$124,797	$120,000	5	—	—	0
	HDI Support Center Manager (HDI-SCM)	$76,379	$71,700	24	$68,110	$68,110	1
	HDI Support Center Team Lead (HDI-SCTL)	$72,510	$71,700	22	$76,821	$70,607	6
HP	AIS: HP ProLiant ML/DL/SL Servers	$83,682	$79,500	36	$84,923	$84,000	15
	AIS: HP Storage Works	$92,223	$65,000	17	$112,685	$113,060	4
	AIS: Network Infrastructure	$96,457	$96,000	19	$113,250	$124,000	4
	AIS: ProCurve Networking	$102,625	$93,000	8	$89,016	$72,000	5
	APC: HP Imaging and Printing Solutions	$76,099	$63,000	12	$114,096	$109,200	5
	APP: Enterprise Solutions	$112,962	$125,000	7	—	—	0
	APS: HP BladeSystem Solutions	$103,059	$95,000	17	$123,810	$123,810	4
	APS: HP LaserJet Solutions	$76,214	$63,000	16	$79,064	$90,600	9
	APS: HP ProLiant ML/DL/SL Servers	$98,286	$80,000	7	$57,520	$55,000	5

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	ASC: HP BladeSystem	$88,274	$65,000	17	$77,000	$77,000	1
	ASC: HP ProCurve Networking	$95,873	$83,500	8	$72,000	$72,000	1
	ASE: HP ProLiant ML/DL Servers	$86,287	$81,000	15	$62,650	$56,900	4
	ASE: HP StorageWorks	$113,523	$100,000	8	$100,000	$100,000	2
	ASE: Network Infrastructure	$93,474	$90,000	16	$79,100	$73,800	6
	Other HP	$92,005	$92,000	33	$52,000	$52,000	1
IBM	IBM Administrator	$99,938	$102,500	14	$94,500	$94,500	2
	IBM Administrator for SOA Solutions	$92,993	$118,000	7	$77,022	$77,022	1
	IBM Advanced Application Developer	$83,987	$80,200	4	$77,022	$77,022	1
	IBM Advanced Database Administrator	$91,571	$120,000	7	—	—	0
	IBM Advanced Deployment Professional	$103,667	$118,000	3	$77,000	$77,000	1
	IBM Advanced Security Professional	$130,100	$132,500	6	—	—	0
	IBM Advanced System Administrator	$101,733	$110,000	13	$96,800	$96,800	1
	IBM Advanced Technical Expert	$77,873	$71,500	8	—	—	0
	IBM Analyst	—	—	0	$77,000	$77,000	1
	IBM Application Developer	$125,000	$125,000	4	—	—	0
	IBM Associate BPM Analyst	$75,000	$75,000	2	$106,509	$106,509	1
	IBM Associate BPM Developer	$103,667	$118,000	3	—	—	0
	IBM Associate Business Process Analyst	$88,333	$90,000	3	$50,650	$50,650	1
	IBM Associate System Administrator	$35,000	$35,000	1	—	—	0
	IBM BPM Developer	$81,000	$81,000	2	—	—	0
	IBM Business Process Analyst	$35,000	$35,000	1	$106,509	$106,509	1

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	IBM Database Administrator	$96,089	$120,000	9	$100,000	$100,000	1
	IBM Database Associate	$94,933	$123,200	3	$90,000	$90,000	1
	IBM Deployment Professional	$75,000	$75,000	1	$90,000	$90,000	1
	IBM Implementation Professional	$143,117	$137,350	3	$93,833	$90,750	3
	IBM Implementation Specialist	$132,000	$110,000	5	$92,875	$90,750	4
	IBM Operator	$66,667	$75,000	3	$66,461	$66,461	2
	IBM Sales Specialist	$99,850	$101,250	5	$90,750	$90,750	2
	IBM SOA Solution Designer	—	—	0	$83,070	$83,070	1
	IBM Solution Advisor	$115,500	$111,000	4	—	—	0
	IBM Solution Developer	$111,400	$114,500	8	—	—	0
	IBM Solution Expert	$110,125	$112,000	8	—	—	0
	IBM Solution Implementer	$115,667	$110,000	3	—	—	0
	IBM Solutions Specialist	$115,372	$111,000	5	$81,000	$81,000	2
	IBM Specialist	$92,533	$88,000	27	$97,441	$96,800	8
	IBM Storage Administrator	$75,167	$65,000	6	$91,667	$87,500	3
	IBM Support Professional	$72,276	$65,000	5	$99,000	$99,000	1
	IBM System Administrator	$97,098	$104,133	22	$79,600	$90,000	3
	IBM Systems Expert	$98,416	$113,600	5	$96,800	$96,800	1
	Other IBM	$103,631	$90,000	21	$109,485	$109,485	2
Internet	Database Design Specialist	$71,382	$65,599	74	$61,000	$61,000	1
	E-Commerce Specialist	$66,665	$62,500	20	$46,000	$46,000	1
	Internet Business Associate	$74,856	$69,000	23	—	—	0

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	JavaScript Specialist	$77,930	$74,000	103	$81,263	$81,263	2
	Network Technology Associate	$68,761	$76,500	18	$93,400	$93,400	2
	Perl Specialist	$94,284	$79,500	17	—	—	0
	Site Development Associate	$65,556	$70,000	29	$31,950	$31,950	2
	Web Design Professional	$77,383	$76,000	77	$73,927	$61,000	3
	Web Design Specialist	$70,124	$65,000	125	$65,718	$61,763	6
	Web Development Professional	$74,748	$75,000	48	$76,000	$72,000	5
	Web Foundations Associate	$70,297	$65,000	125	$62,526	$62,526	1
	Web Security Associate	$69,520	$72,000	9	—	—	0
	Web Security Professional	$111,314	$105,000	7	$100,000	$100,000	1
	Web Security Specialist	$98,640	$72,000	5	$100,000	$100,000	1
	Other Internet	$114,683	$95,000	6	—	—	0
ITIL	ITIL Expert	$103,476	$100,000	29	$92,660	$85,500	10
	ITIL Managing Across the Lifecycle (MALC)	$136,571	$125,000	7	$96,567	$93,196	5
	ITIL Master	$150,000	$150,000	2	$120,000	$120,000	1
	ITIL Service Capability: Operational Support and Analysis	$107,475	$99,000	28	$104,286	$100,000	7
	ITIL Service Capability: Planning, Protection and Optimization	$108,429	$100,000	14	$105,333	$99,000	6
	ITIL Service Capability: Release, Control and Validation	$115,194	$100,000	18	$97,625	$97,500	12
	ITIL Service Capability: Service Offerings and Agreements	$124,680	$125,300	22	$112,079	$100,000	12
	ITIL Service Lifecycle: Continual Service Improvement	$112,849	$110,000	49	$95,421	$97,500	6
	ITIL Service Lifecycle: Service Design	$121,953	$114,100	40	$88,890	$99,000	5
	ITIL Service Lifecycle: Service Operation	$120,245	$115,000	61	$103,176	$99,000	12

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	ITIL Service Lifecycle: Service Strategy	$112,664	$110,000	45	$89,176	$99,000	3
	ITIL Service Lifecycle: Service Transition	$133,962	$119,500	50	$98,353	$96,000	11
	ITIL v3 Foundation	$99,869	$96,000	1063	$94,247	$88,000	289
	Kepner-Tregoe Foundation	$88,412	$100,000	13	$113,167	$109,500	6
	Other ITIL	$108,087	$110,000	23	$80,311	$84,000	15
Juniper	Juniper Networks Certified Associate – Firewall/VPN (JNCIA-FWV)	$104,650	$105,000	10	—	—	0
	Juniper Networks Certified Associate – Junos (JNCIA-Junos)	$93,563	$85,000	113	$95,537	$86,000	21
	Juniper Networks Certified Professional – Enterprise Routing and Switching (JNCIP-ENT)	$94,006	$95,250	18	$84,500	$84,000	4
	Juniper Networks Certified Professional – Security (JNCIP-SEC)	$88,140	$80,000	10	$96,000	$96,000	2
	Juniper Networks Certified Specialist – Enterprise Routing and Switching (JNCIS-ENT)	$95,148	$85,000	27	$113,091	$121,000	11
	Juniper Networks Certified Specialist – Firewall/VPN (JNCIS-FW)	$114,700	$112,000	5	—	—	0
	Juniper Networks Certified Specialist – Security (JNCIS-SEC)	$89,383	$85,000	15	$99,975	$90,525	6
	Other Juniper	$81,366	$70,000	9	—	—	0
Knowledge Management	Knowledge Center Support Fundamentals	$85,873	$76,150	20	$119,466	$144,000	3
	Knowledge Center Support Principles	$88,660	$82,000	21	$62,570	$64,900	5
Microsoft	MCITP: Database Administrator	$102,284	$100,000	38	$72,279	$80,000	12
	MCITP: Enterprise Administrator	$100,361	$90,000	176	$79,760	$72,804	26
	MCITP: Enterprise Desktop Administrator 7	$87,782	$85,000	122	$89,142	$87,000	21
	MCITP: Enterprise Desktop Support Technician 7	$83,942	$84,000	90	$82,658	$75,600	25
	MCITP: Enterprise Support Technician	$88,257	$84,000	116	$80,198	$75,600	15
	MCITP: Microsoft Certified IT Professional	$94,450	$88,000	190	$78,444	$80,000	34
	MCITP: Server Administrator	$97,293	$90,000	142	$73,615	$75,975	25

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	MCSA: SQL Server 2012	$101,480	$90,000	19	$50,954	$40,000	7
	MCSA: Windows 7	$76,120	$72,000	152	$70,604	$70,607	27
	MCSA: Windows 8	$91,647	$87,750	27	$54,333	$58,000	3
	MCSA: Windows Server 2008	$89,288	$84,000	139	$89,047	$84,546	24
	MCSA: Windows Server 2012	$76,988	$70,000	171	$73,226	$70,000	47
	MCSD: Web Applications	$94,300	$88,000	37	$64,130	$64,130	1
	MCSD: Windows Metro Style Apps Using C#	$99,367	$94,000	15	$81,400	$81,400	2
	MCSD: Windows Metro Style Apps Using HTML 5	$84,875	$92,250	4	—	—	0
	MCSD: Windows Store Apps	$90,630	$94,000	9	$61,600	$61,600	1
	MCSE: Business Intelligence	$131,111	$90,000	9	$89,788	$89,788	2
	MCSE: Communication	$135,218	$120,000	9	$83,725	$90,600	3
	MCSE: Data Platform	$144,140	$134,000	10	$66,330	$66,330	2
	MCSE: Desktop Infrastructure	$101,538	$83,000	35	$71,782	$78,000	7
	MCSE: Messaging	$130,917	$121,000	35	$86,973	$91,960	13
	MCSE: Private Cloud	$118,082	$98,500	22	$83,197	$81,323	8
	MCSE: Server Infrastructure	$111,154	$102,000	68	$79,641	$81,040	17
	MCSE: SharePoint	$83,557	$83,500	14	$75,455	$66,000	5
	MCTS: Microsoft Exchange Server 2007, Configuration	$107,815	$104,646	29	$86,077	$84,000	11
	MCTS: Microsoft Office SharePoint Server 2007 – Configuration	$106,418	$92,000	22	$78,667	$72,000	3
	MCTS: SQL Server 2005	$103,173	$98,300	15	$84,000	$84,000	3
	MCTS: Windows 7, Configuration	$75,211	$73,000	139	$79,547	$75,000	21
	MCTS: Windows Server 2008 Active Directory Configuration	$88,112	$84,000	91	$77,924	$72,804	24

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	MCTS: Windows Server 2008 Applications Infrastructure Configuration	$94,485	$85,000	75	$97,849	$95,850	10
	MCTS: Windows Server 2008 Network Infrastructure Configuration	$87,025	$84,000	73	$82,727	$80,000	23
	MCTS: Windows Vista, Configuration	$102,267	$90,000	47	$79,027	$77,304	8
	Microsoft Certified Application Developer (MCAD)	$86,090	$85,000	10	$41,535	$41,535	2
	Microsoft Certified Architect (MCA)	$90,562	$80,000	35	$75,421	$83,070	8
	Microsoft Certified Database Administrator (MCDBA)	$100,034	$95,000	36	$81,124	$66,000	7
	Microsoft Certified Desktop Support Technician (MCDST)	$81,917	$80,000	167	$77,237	$72,000	31
	Microsoft Certified Professional (MCP)	$82,618	$78,000	804	$78,015	$72,609	150
	Microsoft Certified Professional Developer (MCPD)	$93,891	$89,600	39	$76,734	$86,265	6
	Microsoft Certified Solutions Associate (MCSA)	$91,273	$84,000	201	$79,969	$78,020	40
	Microsoft Certified Solutions Developer (MCSD)	$108,247	$88,000	12	$60,000	$60,000	2
	Microsoft Certified Solutions Expert (MCSE 2012)	$86,893	$81,500	46	$84,830	$75,000	15
	Microsoft Certified Solutions Expert (MCSE)	$102,868	$88,000	41	$77,541	$70,000	13
	Microsoft Certified Systems Administrator (MCSA)	$88,043	$84,900	178	$87,502	$93,400	22
	Microsoft Certified Systems Engineer (MCSE 2003)	$106,925	$100,000	179	$91,849	$88,200	26
	Microsoft Certified Systems Engineer (MCSE)	$101,918	$93,000	253	$85,727	$84,000	63
	Microsoft Certified Technology Specialist (MCTS)	$82,492	$80,000	198	$78,991	$80,000	24
	Microsoft Certified Trainer (MCT)	$117,043	$120,000	23	$122,667	$109,000	3
	Microsoft Technology Associate (MTA)	$65,821	$60,000	141	$88,825	$90,525	5
	MOS: Microsoft Office Specialist	$79,097	$80,000	49	$92,620	$90,600	7
	Other Microsoft	$86,357	$87,500	68	$76,613	$75,038	17
Networking	Wireshark Certified Network Analyst (WCNA)	$87,170	$80,000	237	$79,455	$79,250	44

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	Other Networking	$86,214	$80,500	228	$84,669	$80,000	35
Novell	Certified Linux Administrator (CLA) – Novell	$70,921	$57,200	17	—	—	0
	Certified Linux Desktop Administrator (CLDA) – Novell	$99,000	$99,000	1	—	—	0
	Certified Linux Engineer (CLE) – Novell	$99,000	$99,000	1	—	—	0
	Certified Linux Professional (CLP) – Novell	$156,500	$156,500	2	—	—	0
	Certified Novell Administrator (CNA)	$95,481	$90,000	102	$85,689	$83,535	38
	Certified Novell Engineer (CNE)	$105,686	$100,000	77	$86,700	$87,500	18
	Certified Novell Instructor (CNI)	$160,000	$160,000	2	—	—	0
	Master Certified Novell Engineer (MCNE)	$84,600	$78,000	10	$96,600	$96,000	3
	Novell Certified Administrator (NCA)	$112,915	$100,000	13	$74,732	$84,000	5
	Novell Certified Engineer (NCE)	$163,500	$165,000	4	—	—	0
	Other Novell	$177,333	$195,000	3	$91,818	$91,818	2
Oracle	Oracle 10g OCA	$100,684	$92,000	24	$70,251	$74,500	10
	Oracle 10g OCP	$97,538	$87,351	14	$96,492	$104,060	5
	Oracle 11g OCA	$85,506	$80,950	34	$74,946	$72,923	8
	Oracle8i DBA OCP	$136,759	$146,000	11	$124,575	$124,575	2
	Oracle9i DBA OCA	$107,667	$115,500	6	$73,213	$80,000	3
	Oracle9i DBA OCP	$126,500	$127,500	12	$88,836	$80,000	3
	Oracle9i OCM	$171,000	$171,000	2	$110,000	$110,000	2
	Other Oracle/DB	$64,212	$62,500	10	$84,000	$84,000	1
Project Management	Certified Associate in Project Management (CAPM)	$76,525	$70,000	30	$78,102	$75,000	17
	Certified ICAgile Professional	$95,625	$92,500	8	$89,800	$84,700	3

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	Certified ScrumMaster	$108,689	$102,000	84	$99,570	$92,690	18
	CompTIA Project+	$76,279	$70,000	247	$83,601	$80,918	16
	PMI Agile Certified Practitioner (PMI-ACP)	$119,349	$116,000	14	$114,750	$119,000	4
	PMI Risk Management Professional (PMI-RMP)	$126,569	$102,000	10	—	—	0
	PMI Scheduling Professional (PMI-SP)	$52,333	$50,000	3	—	—	0
	Portfolio Management Professional (PfMP)	$106,280	$90,000	5	—	—	0
	Prince2	$99,657	$91,750	19	$93,726	$90,000	13
	Program Management Professional (PgMP)	$126,515	$124,000	19	$90,334	$86,585	12
	Project Management Professional (PMP)	$116,094	$115,000	314	$102,091	$96,800	123
	Other Project Management	$90,544	$85,000	73	$98,505	$96,000	28
Red Hat	Red Hat Certified Architect (RHCA)	$116,778	$100,000	17	$48,581	$48,581	2
	Red Hat Certified Engineer (RHCE)	$101,824	$103,000	69	$78,333	$78,250	8
	Red Hat Certified JBoss Administrator (RHCJA)	$95,286	$73,000	7	—	—	0
	Red Hat Certified JBoss Developer (RHCJD)	$150,400	$131,200	3	—	—	0
	Red Hat Certified Virtualization Administrator (RHCVA)	$115,000	$50,000	5	$69,300	$85,200	3
	Red Hat System Administrator (RHCSA)	$92,748	$84,142	106	$87,673	$85,200	20
	Other Red Hat	$80,046	$63,000	46	$44,667	$42,000	3
SAP	SAP Certified Application Associate – Financial Accounting with ERP 6.0	$108,833	$120,000	3	$90,525	$90,525	1
	SAP Certified Application Associate – Financial Accounting with SAP ERP 6.0	$158,000	$158,000	2	$106,509	$106,509	1
	SAP Certified Application Associate – Human Capital Management with SAP ERP 6.0	$149,000	$141,000	3	—	—	0
	SAP Certified Application Associate – Order Fulfillment with SAP ERP 6.0	$122,000	$122,000	1	—	—	0
	SAP Certified Application Associate – Procurement with SAP ERP 6.0	—	—	0	$96,800	$96,800	2

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	SAP Certified Application Associate – Sales and Distribution, ERP 6.0	$168,000	$121,000	4	—	—	0
	SAP Certified Application Associate – SAP BusinessObjects Web Intelligence	$100,000	$100,000	2	—	—	0
	SAP Certified Application Associate – SAP HANA	—	—	0	$100,000	$100,000	1
	SAP Certified Associate – Business Foundation & Integration with SAP ERP 6.0	$107,467	$130,000	3	$132,600	$96,000	3
	SAP Certified Development Associate – ABAP with SAP NetWeaver	$104,250	$104,250	2	$139,150	$139,150	1
	SAP Certified Support Associate – SAP HANA	$170,000	$100,000	3	—	—	0
	SAP Certified Technology Associate – OS/DB Migration	$100,000	$100,000	2	—	—	0
	SAP Certified Technology Associate – SAP HANA	$99,000	$99,000	4	$100,000	$100,000	1
	Other SAP	$101,125	$101,125	2	$168,500	$168,500	2
Security	Blue Coat Certified Proxy Administrator (BCCPA)	$108,208	$105,000	6	—	—	0
	Blue Coat Certified Proxy Professional (BCCPP)	$118,875	$118,875	2	—	—	0
	Certified Authorization Professional (CAP)	$102,292	$103,000	49	$122,950	$125,400	4
	Certified Cyber Forensics Professional (CCFP)	$137,000	$137,000	1	—	—	0
	Certified Ethical Hacker (CEH)	$103,297	$104,000	168	$88,794	$88,500	10
	Certified in Risk and Information Systems Control (CRISC)	$122,954	$120,000	241	$110,251	$108,000	33
	Certified Information Security Manager (CISM)	$122,291	$119,000	328	$113,722	$109,000	49
	Certified Information Systems Auditor (CISA)	$113,320	$110,000	504	$110,128	$102,500	70
	Certified Information Systems Security Professional (CISSP)	$121,923	$119,000	522	$113,221	$110,000	67
	Certified Secure Software Lifecycle Professional (CSSLP)	$129,859	$130,500	16	—	—	0
	Certified SonicWALL Security Professional (CSSP)	$91,081	$68,500	6	—	—	0
	Certified SonicWALL System Administrator (CCSA) for Network Security	$81,414	$60,000	6	$62,526	$62,526	1
	Check Point Certified Security Administrator (CCSA)	$99,783	$100,000	23	$130,333	$130,000	6

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	Check Point Certified Security Expert (CCSE)	$108,677	$95,000	13	$110,845	$130,000	7
	CISSP: Information Systems Security Architecture Professional (CISSP-ISSAP)	$132,960	$135,368	26	$90,350	$90,525	3
	CISSP: Information Systems Security Engineering Professional (CISSP-ISSEP)	$126,761	$132,000	11	$77,000	$77,000	1
	CompTIA Security+	$81,467	$75,000	1216	$79,246	$74,400	89
	Computer Hacking Forensic Investigator (CHFI) v8	$103,783	$100,000	15	—	—	0
	CSFI Defensive Cyber Operations Engineer (DCOE)	$90,000	$90,000	1	—	—	0
	CSX Practitioner	$129,261	$125,000	9	—	—	0
	EC-Council Certified Security Analyst (ECSA) v8	$113,167	$114,000	6	$50,650	$50,650	1
	F5 Certified Application Delivery Engineer	$121,950	$118,000	5	$50,650	$50,650	1
	F5 Certified BIG-IP Administrator	$112,811	$111,300	9	—	—	0
	F5 Certified Master Application Delivery Engineer	$108,667	$118,000	3	—	—	0
	F5 Certified Technology Specialist	$104,556	$109,000	18	$104,639	$99,000	3
	HealthCare Information Security and Privacy Practitioner (HCISPP)	$142,077	$120,000	13	—	—	0
	Other Security	$111,122	$106,500	156	$94,430	$99,000	22
	Symantec Certified Professional (SCP)	$102,478	$87,702	7	$129,750	$129,750	4
	Symantec Certified Specialist (SCS)	$103,000	$103,000	1	$181,500	$181,500	2
	System Security Certified Practitioner (SSCP)	$107,909	$120,000	11	$78,650	$78,650	1
	Systems Security Certified Practitioner (SSCP)	$104,025	$110,000	15	—	—	0
Sun	Sun Certified Business Component Developer (SCBCD)	$130,000	$130,000	2	—	—	0
	Sun Certified Developer for Java Web Services (SCDJWS)	$140,000	$140,000	1	—	—	0
	Sun Certified Enterprise Architect (SCEA)	$140,000	$140,000	1	—	—	0
	Sun Certified Java Associate (SCJA)	$93,846	$100,000	13	—	—	0

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	Sun Certified Java Developer (SCJD)	$135,000	$130,000	5	—	—	0
	Sun Certified Java Programmer (SCJP)	$112,708	$108,000	19	$56,757	$56,757	2
	Sun Certified Network Administrator (SCNA)	$126,578	$131,200	9	$69,663	$75,000	4
	Sun Certified Security Administrator (SCSECA)	$250,000	$250,000	1	$78,000	$78,000	2
	Sun Certified Solaris Associate (SCSAS)	$127,833	$101,000	6	$93,333	$95,000	3
	Sun Certified System Administrator (SCSA)	$111,988	$109,500	32	$94,700	$83,250	10
	Sun Certified Web Component Developer (SCWCD)	$126,333	$130,000	3	$69,225	$69,225	1
	Other Sun	$150,000	$150,000	2	—	—	0
VMware	VMware Certified Advanced Professional 5 – Data Center Administration (VCAP5-DCA)	$103,242	$103,300	44	$79,845	$75,000	11
	VMware Certified Advanced Professional 5 – Data Center Design (VCAP5-DCD)	$98,737	$100,000	11	—	—	0
	VMware Certified Associate – Cloud (VCA-Cloud)	$93,805	$93,500	37	$78,040	$85,730	12
	VMware Certified Associate – Data Center Virtualization (VCA-DCV)	$79,212	$72,632	60	$88,749	$90,200	19
	VMware Certified Associate - Network Virtualization (VCA-NV)	$108,111	$92,500	23	$74,028	$85,263	6
	VMware Certified Associate – Workforce Mobility (VCA-WM)	$90,688	$89,820	15	$84,458	$95,850	8
	VMware Certified Associate 6 – Cloud Management and Automation (VCA6-CMA)	$70,457	$71,642	10	—	—	0
	VMware Certified Associate 6 – Data Center Virtualization (VCA6-DCV)	$95,519	$85,000	98	$88,773	$91,960	16
	VMware Certified Associate 6 – Desktop and Mobility (VCA6-DTM)	$90,606	$83,283	18	$89,800	$85,200	3
	VMware Certified Associate 6 – Hybrid Cloud (VCA6-HC)	$104,009	$88,000	11	$99,000	$99,000	1
	VMware Certified Associate 6 – Network Virtualization (VCA6-NV)	$95,404	$86,601	12	—	—	0
	VMware Certified Professional – Cloud (VCP-Cloud)	$104,744	$91,750	22	$72,091	$60,500	7
	VMware Certified Professional – Network Virtualization (VCP-NV)	$102,716	$87,851	34	$106,736	$102,000	5
	VMware Certified Professional 5 – Data Center Virtualization (VCP5-DCV)	$99,334	$98,000	237	$93,341	$87,500	57

AREA	CERTIFICATION	U.S.			CANADA		
		MEAN	MEDIAN	COUNT	MEAN	MEDIAN	COUNT
	VMware Certified Professional 5 – Desktop (VCP5-DT)	$103,253	$100,000	32	$99,750	$99,000	4
	VMware Certified Professional 6 – Cloud (VCP6-Cloud)	$135,250	$110,500	8	—	—	0
	VMware Certified Professional 6 – Cloud Management and Automation (VCP6-CMA)	$105,010	$97,050	10	$85,500	$85,500	2
	VMware Certified Professional 6 – Data Center Virtualization (VCP6-DCV)	$96,009	$87,000	65	$59,500	$53,250	3
	VMware Certified Professional 6 – Desktop (VCP6-DT)	$98,085	$101,600	13	$73,500	$73,500	2
	VMware Certified Professional 6 – Desktop and Mobility (VCP6-DTM)	$110,063	$96,200	15	$67,334	$68,110	5
	VMware Certified Professional 6 – Network Virtualization (VCP6-NV)	$101,174	$93,500	21	$58,203	$53,250	3
	VMware Design Expert – Cloud (VCDX-Cloud)	$116,000	$116,000	2	—	—	0
	VMware Design Expert – Desktop (VCDX-DT)	$93,820	$101,600	5	—	—	0
	VMware Design Expert – Network Virtualization (VCDX-NV)	$70,500	$70,500	1	—	—	0
	VMware Design Expert 5 – Data Center Virtualization (VCDX5-DCV)	$102,546	$95,000	13	$180,000	$180,000	2
	VMware Implementation Expert – Network Virtualization (VCIX-NV)	$166,250	$181,500	4	$180,000	$180,000	2
Virtualization	Certified Virtualization Desktop Administrator (CVDA)	$103,204	$95,000	30	$78,420	$73,800	5
	Certified Virtualization Desktop Expert (CVDE)	$107,802	$109,500	10	$99,000	$99,000	1
	Certified Virtualization Expert (CVE)	$111,619	$100,000	21	$89,576	$89,413	8
	Certified Virtualization Security Expert (CVSE)	$100,000	$100,000	2	—	—	0
	Virtualization Council Master Infrastructure Architect (VC-MIA)	$135,000	$135,000	1	—	—	0
	Virtualization Council Virtualization Infrastructure Professional (VC-VIP)	$106,083	$118,250	6	$85,244	$87,500	4
	Other Virtualization	$106,771	$115,000	17	$76,200	$76,200	2
Wireless	Certified Wireless Network Administrator (CWNA)	$92,889	$83,500	106	$108,733	$111,000	12
	Certified Wireless Security Professional (CWSP)	$104,411	$100,300	22	$110,923	$114,345	4
	Certified Wireless Technology Specialist (CWTS)	$83,077	$77,000	41	$103,007	$82,000	3
	Other Wireless	$85,929	$80,500	38	$150,000	$150,000	2

SALARIES BY STATE

State	IT Staff			IT Decision-Makers			IT Total		
	Mean	Median	Count	Mean	Median	Count	IT Mean	Median	IT Count
Alabama	$77,045	$60,000	53	$95,982	$95,000	32	$84,174	$75,000	85
Alaska	$78,494	$72,000	19	$90,670	$100,000	5	$81,031	$77,552	24
Arizona	$76,233	$70,000	124	$112,302	$112,650	66	$88,762	$85,000	190
Arkansas	$68,485	$65,000	35	$76,111	$85,000	9	$70,045	$69,600	44
California	$84,859	$80,000	439	$117,364	$116,000	231	$96,066	$90,500	670
Colorado	$76,658	$75,000	151	$103,938	$96,750	48	$83,238	$80,000	199
Connecticut	$87,728	$81,000	46	$103,843	$92,000	23	$93,100	$85,000	69
Delaware	$83,041	$84,000	8	$70,800	$60,000	7	$77,328	$84,000	15
District of Columbia	$89,184	$88,000	58	$136,662	$125,000	27	$104,265	$102,000	85
Florida	$74,377	$70,000	257	$111,901	$103,000	135	$87,300	$80,840	392
Georgia	$72,602	$70,000	202	$100,428	$100,000	64	$79,297	$76,000	266
Hawaii	$84,289	$82,600	11	$116,863	$98,000	8	$98,004	$92,000	19
Idaho	$63,196	$61,250	22	$110,740	$125,610	3	$68,901	$68,000	25
Illinois	$78,860	$75,000	253	$109,051	$109,000	91	$86,846	$82,750	344
Indiana	$63,247	$60,000	76	$85,117	$87,000	36	$70,277	$69,000	112
Iowa	$70,067	$71,000	48	$93,550	$87,500	24	$77,895	$74,000	72
Kansas	$66,538	$63,000	39	$94,240	$92,000	25	$77,359	$70,200	64
Kentucky	$63,901	$56,392	34	$86,667	$88,000	18	$71,781	$71,000	52
Louisiana	$63,889	$60,000	39	$106,909	$85,000	11	$73,353	$67,050	50
Maine	$70,965	$70,000	27	$67,500	$67,500	1	$70,841	$70,000	28
Maryland	$85,480	$81,500	148	$128,074	$127,000	74	$99,678	$100,000	222
Massachusetts	$76,250	$70,000	118	$120,808	$119,000	53	$90,060	$85,000	171

State	IT Staff			IT Decision-Makers			IT Total		
	Mean	Median	Count	Mean	Median	Count	IT Mean	Median	IT Count
Michigan	$73,437	$70,000	120	$109,367	$105,000	43	$82,915	$79,000	163
Minnesota	$80,841	$80,500	110	$110,916	$105,000	56	$90,987	$89,961	166
Mississippi	$54,907	$51,129	14	$88,129	$75,000	14	$71,518	$65,360	28
Missouri	$68,733	$63,000	122	$109,570	$105,000	45	$79,737	$73,000	167
Montana	$54,056	$51,064	14	$76,494	$90,000	3	$58,016	$51,064	17
North Dakota	$62,125	$56,650	23	—	—	0	$62,125	$56,650	23
Nebraska	$69,217	$77,000	35	$92,250	$91,000	10	$74,335	$77,500	45
Nevada	$70,369	$67,500	27	$95,931	$100,000	13	$78,676	$72,000	40
New Hampshire	$59,182	$53,250	22	$121,675	$122,600	4	$68,796	$57,250	26
New Jersey	$87,878	$87,000	148	$108,542	$100,000	62	$93,979	$90,500	210
New Mexico	$62,151	$59,000	40	$117,875	$123,750	4	$67,217	$64,680	44
New York	$80,699	$77,000	293	$122,667	$115,000	155	$95,219	$86,250	448
North Carolina	$73,619	$68,000	269	$108,285	$101,000	68	$80,614	$77,000	337
Ohio	$73,980	$71,000	189	$104,584	$104,030	92	$84,000	$80,000	281
Oklahoma	$66,369	$59,000	48	$91,000	$100,000	23	$74,348	$68,000	71
Oregon	$77,993	$71,500	83	$109,625	$105,000	26	$85,539	$80,000	109
Pennsylvania	$72,569	$68,000	171	$108,222	$108,850	81	$84,029	$80,325	252
Rhode Island	$68,307	$57,500	16	$115,500	$115,500	2	$73,551	$70,000	18
South Carolina	$73,567	$68,500	60	$121,653	$120,000	14	$82,664	$75,000	74
South Dakota	$69,325	$60,205	13	$113,333	$110,000	6	$83,223	$81,000	19
Tennessee	$66,481	$63,000	81	$113,662	$116,200	26	$77,945	$71,000	107
Texas	$77,865	$75,000	542	$110,559	$104,500	206	$86,869	$82,000	748
Utah	$67,994	$63,000	71	$104,772	$92,000	24	$77,285	$70,000	95

State	IT Staff			IT Decision-Makers			IT Total		
	Mean	Median	Count	Mean	Median	Count	IT Mean	Median	IT Count
Vermont	$35,750	$33,750	3	$75,667	$75,000	6	$62,361	$72,000	9
Virginia	$88,486	$81,000	257	$129,460	$128,000	147	$103,395	$100,000	404
Washington	$77,439	$74,000	126	$109,538	$107,000	48	$86,294	$81,500	174
West Virginia	$52,660	$47,800	28	$88,378	$83,000	9	$61,348	$54,000	37
Wisconsin	$74,564	$71,850	102	$100,664	$105,000	37	$81,511	$82,000	139
Wyoming	$64,772	$48,000	13	$71,000	$71,000	2	$65,602	$70,000	15

SALARIES BY PROVINCE

Province/Territory	IT Staff			IT Decision-Makers			IT Total		
	Mean	Median	Count	Mean	Median	Count	Mean	Median	Count
Alberta	$70,512	$70,000	172	$97,885	$84,000	31	$74,692	$70,550	203
British Columbia	$57,630	$55,000	143	$101,977	$96,000	34	$66,149	$60,000	177
Manitoba	$64,847	$65,000	46	$68,552	$65,000	16	$65,803	$65,000	62
New Brunswick	$56,129	$55,000	19	$58,814	$67,728	5	$56,688	$55,000	24
Newfoundland and Labrador	$57,853	$55,000	23	$84,976	$100,000	5	$62,696	$56,440	28
Northwest Territories	—	—	0	$92,500	$92,500	2	$92,500	$92,500	2
Nova Scotia	$62,157	$60,000	41	$76,270	$67,729	8	$64,461	$64,000	49
Nunavut	—	—	0	—	—	0	—	—	0
Ontario	$65,516	$65,000	502	$96,433	$97,000	121	$71,520	$69,845	623
Prince Edward Island	$65,500	$66,500	8	—	—	0	$65,500	$66,500	8
Quebec	$63,033	$60,000	140	$83,377	$80,000	70	$69,814	$69,110	210
Saskatchewan	$66,444	$65,000	37	$92,200	$92,000	5	$69,510	$66,251	42
Yukon	—	—	0	—	—	0	—	—	0