2017 SALARY GUIDE
FOR TECHNOLOGY PROFESSIONALS

rh Robert Half®
Technology

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rht.com/salary-center

WELCOME TO THE 2017 ROBERT HALF TECHNOLOGY SALARY GUIDE

Just as businesses must keep pace with emerging technologies, they also must stay current on salary trends to recruit and retain the best people.

Our research shows employers are increasingly willing to negotiate pay rates. During these conversations, it's helpful to have a strong understanding of how compensation is trending, both for a specific role and in your area.

That's why, for decades, we have published our annual Robert Half Technology Salary Guide. It's designed to help employers evaluate compensation trends and develop a talent strategy that aligns with their industry and region.

We've tapped our deep networks to identify the latest salary ranges in the IT industry, as well as the most recent hiring and workplace trends.

We also understand that each hiring situation is different. That's where the personal expertise of our technology staffing and recruiting professionals across the country comes in. Let us be your resource as you set compensation levels for new hires, plan budgets and work to better understand the current hiring environment.

ABOUT THE DATA IN THE GUIDE

The 2017 Robert Half Technology Salary Guide features salary ranges for more than 75 positions in the technology field.

Our salary data are based chiefly on input from our North American recruiting and staffing professionals who make thousands of full-time, temporary and project placements each year. The projected salaries for each position reflect base pay only. Bonuses, incentives and other forms of compensation are not taken into account.

Since professionals joining a company may enter at a variety of experience levels, we report salaries in ranges. The ranges represent national averages and can be adjusted for your market by using the local variance numbers on Pages 14-15 for the United States and Page 21 for Canada. Hiring trends and other information in the guide are based on our surveys of hiring managers and other executives in the technology field.

NEED HELP WITH YOUR JOB DESCRIPTIONS?

Access our list of job descriptions. Use them as a starting point, and customize them to fit your positions.

Visit **rht.com/it-job-descriptions**

IT HIRING TRENDS: EMPLOYERS GET MORE STRATEGIC

Businesses across North America depend on highly skilled IT talent to support a wide range of technology initiatives, but many find it challenging to staff open positions. The reason: a shortage of qualified candidates available for immediate hire.

When in-demand candidates do enter the hiring market, they are often snapped up at lightning speed. Employers can lose out on top talent when their hiring process is too lengthy. The IT professionals they want to recruit may already be interviewing with several other companies — or considering multiple offers.

To compete, employers find they must be prepared to extend generous offers with above-market pay and other compelling incentives, such as signing bonuses and work-from-home options. Retention tactics to keep talented team members on board are also top of mind, pushing managers to emphasize career pathing, provide opportunities to innovate and pay

special attention to work volume in order to avoid employee burnout.

In addition, many organizations are applying a new strategy: making full-time hires only for the most essential IT positions and engaging interim specialized support, as needed, to staff projects or implementations and to meet growing business demands.

MOVING FAST BUT NOT RUSHING
Though employers realize they must move quickly to interview and extend job offers, they also want to take care to choose candidates who are likely to thrive in their organization. Expect to see more employers conducting interviews led by panels or teams as a way to assess a potential hire's fit.

Many businesses remain willing to recruit IT professionals who meet most of their hiring criteria and then invest in training to address specific skills gaps. This is likely why midlevel technology professionals with a solid mix of technical and soft skills are in high demand.

Companies know they can groom these candidates to lead IT initiatives, instead of waiting indefinitely for harder-to-find — and costlier-to-hire — senior-level professionals.

CANDIDATES: SHOW A TRACK RECORD OF SUCCESS

Job seekers may have an advantage in the current IT hiring environment, but they still need to show discerning employers how they can create value for the organization.

Employers are working to fast-track hiring, so candidates should learn how to put their best foot forward and be prepared for the possibility of a video interview as a first step. This is becoming a common strategy to accelerate the hiring process.

When applying and interviewing for technology roles, candidates should:

1 Be prepared to discuss technical skills in-depth.

2 Provide relevant work samples and explain their part in developing each project and its outcome.

3 Present a work history that shows measurable career progression.

4 Exhibit a proven track record of delivering results to previous employers — for example, completing projects before deadlines or reducing costs.

5 Demonstrate strong communication skills.

PROJECT AND CONSULTING WORK ABOUNDS

Project and consulting opportunities in technology, which have become more plentiful in recent years, are likely to remain steady in 2017.

Many businesses have reached a tipping point with their IT ecosystem where it is now imperative that they significantly upgrade legacy technology, such as enterprise resource planning (ERP) systems, or migrate to new solutions.

Other organizations are looking to simplify IT and move more processes to the cloud. Big data, mobile and security initiatives remain at the top of to-do lists for many organizations.

All of the above activities require specialized IT talent, with very specific skill sets, for a limited duration. This trend has contributed to the increased need for project professionals and consultants.

CIOs share the single greatest benefit of using contract or project professionals for their business:

35%
To access specialized skills or knowledge

22%
To assist staff during peak workload periods

21%
To minimize costs of hiring full-time employees

20%
To evaluate a candidate's abilities before hiring full time

Source: Robert Half Technology survey of more than 2,500 CIOs in the United States. Only the top responses are shown.

PROJECT AND CONSULTING WORK ABOUNDS

TECHNOLOGY ROLES IN DEMAND
In the year ahead, look for many
employers across North America
to hire both full-time and contract
professionals in these roles:

- Developers (web, software
  and mobile applications)

- Business intelligence analysts

- Database administrators

- Help desk and desktop
  support professionals
  (especially Tiers 2 and 3)

- Systems engineers and
  systems administrators

86% of CIOs say they engage in retention activities;
some of their top strategies include the following:

69%	Regularly checking in with employees to ensure they are happy in their role
68%	Regularly evaluating performance and discussing career development
60%	Regularly benchmarking compensation and benefits in order to stay competitive

Source: Robert Half Technology survey of more than 2,500 CIOs in the United States

TECHNOLOGY SALARIES:
UNITED STATES

Title	2016	2017	% Change
ADMINISTRATION			
Chief Information Officer (CIO)	$172,000 - $268,250	$175,000 - $279,000	3.1%
Chief Technology Officer (CTO)	$147,500 - $229,000	$149,000 - $240,000	3.3%
Chief Security Officer	$140,250 - $222,500	$145,250 - $236,750	5.3%
Vice President of Information Technology	$141,000 - $225,000	$143,250 - $234,250	3.1%
Director of Technology	$122,750 - $185,000	$124,500 - $193,500	3.3%
Information Technology Manager	$105,750 - $159,000	$108,000 - $164,750	3.0%
APPLICATIONS DEVELOPMENT (A)			
Manager	$105,750 - $160,500	$107,750 - $167,250	3.3%
Project Manager	$ 95,250 - $146,500	$ 97,250 - $151,750	3.0%
Systems Analyst	$ 81,750 - $121,000	$ 84,500 - $125,000	3.3%
Applications Architect	$121,250 - $171,750	$124,500 - $178,750	3.5%
Business Systems Analyst	$ 84,000 - $122,000	$ 86,250 - $127,000	3.5%
CRM Business Analyst	$ 87,500 - $126,000	$ 89,500 - $132,250	3.9%
CRM Technical Developer	$ 98,500 - $137,750	$100,000 - $146,000	4.1%
Developer/Programmer Analyst	$ 80,000 - $137,000	$ 83,000 - $143,250	4.3%
ERP Business Analyst	$ 92,500 - $132,000	$ 95,000 - $137,750	3.7%
ERP Technical/Functional Analyst	$ 98,000 - $140,750	$100,000 - $146,250	3.1%
ERP Technical Developer	$100,750 - $148,500	$102,750 - $154,250	3.1%
Lead Applications Developer	$110,750 - $160,750	$115,000 - $167,000	3.9%
Mobile Applications Developer	$115,250 - $175,750	$118,750 - $182,250	3.4%
Technical Writer	$ 55,500 - $ 87,250	$ 56,500 - $ 89,250	2.1%

(A) Add the percentage below, based on national averages, to IT salaries for the following skills:

AJAX (Asynchronous JavaScript and XML) development skills.............................. 5%
Business Objects skills............................... 5%
C# development skills 7%
C++ development skills 4%
Hyperion skills.. 5%

Java development skills................................ 8%
Java EE/J2EE development skills 8%
LAMP (Linux, Apache, MySQL and Perl/PHP/Python) skills 7%
.NET development skills 7%
PHP development skills 7%
SAP development skills................................ 5%
SharePoint skills... 8%

TECHNOLOGY SALARIES: UNITED STATES

Title	2016	2017	% Change
CONSULTING & SYSTEMS INTEGRATION			
Director	$123,750 - $190,250	$126,750 - $198,000	3.4%
Practice Manager	$125,000 - $173,500	$127,750 - $180,000	3.1%
Project Manager/Senior Consultant	$100,750 - $154,250	$103,750 - $160,500	3.6%
Staff Consultant	$ 79,250 - $116,250	$ 81,250 - $121,500	3.7%
Senior IT Auditor	$116,000 - $164,250	$121,000 - $173,500	5.1%
IT Auditor	$ 95,000 - $144,750	$ 98,500 - $153,000	4.9%
DATA/DATABASE ADMINISTRATION (B)			
Big Data Engineer	$129,500 - $183,500	$135,000 - $196,000	5.8%
Database Manager	$118,000 - $170,500	$122,250 - $177,000	3.7%
Database Developer	$103,250 - $153,250	$108,000 - $161,500	5.1%
Database Administrator	$ 95,750 - $142,750	$ 98,500 - $148,500	3.6%
Data Analyst/Report Writer	$ 74,500 - $114,500	$ 77,500 - $118,750	3.8%
Data Architect	$127,250 - $175,500	$131,250 - $184,000	4.1%
Data Modeler	$106,750 - $155,500	$111,000 - $161,500	3.9%
Data Scientist	$109,000 - $153,750	$116,000 - $163,500	6.4%
Data Warehouse Manager	$123,750 - $172,000	$129,000 - $179,000	4.1%
Data Warehouse Analyst	$105,000 - $152,000	$107,500 - $155,750	2.4%
Business Intelligence Analyst	$113,750 - $164,000	$118,000 - $171,750	4.3%
Electronic Data Interchange (EDI) Specialist	$ 76,500 - $115,500	$ 77,500 - $118,750	2.2%
Portal Administrator	$ 94,000 - $134,250	$ 96,000 - $138,750	2.8%
QUALITY ASSURANCE (QA) & TESTING (C)			
QA Engineer – Manual	$ 64,750 - $ 91,500	$ 66,250 - $ 94,500	2.9%
QA Engineer – Automated	$ 74,750 - $109,000	$ 76,750 - $112,750	3.1%
QA/Testing Manager	$ 93,750 - $127,500	$ 95,750 - $132,000	2.9%
QA Associate/Analyst	$ 65,000 - $100,250	$ 67,000 - $102,750	2.7%

(B) Add the percentage below, based on national averages, to IT salaries for the following skills:
ETL skills 6%
Hadoop 7%
Microsoft SQL Server database skills 8%
Oracle database skills 6%

(C) Add the percentage below, based on national averages, to IT salaries for the following skills:
Performance testing (e.g., Mercury
  Interactive Tools) skills................................ 5%

Title	2016	2017	% Change
WEB DEVELOPMENT (D)			
Senior Web Developer	$111,250 - $154,000	$116,250 - $161,500	4.7%
Web Developer	$ 78,500 - $129,500	$ 82,750 - $135,500	4.9%
Front-End Web Developer	$ 79,750 - $111,250	$ 83,250 - $119,500	6.2%
Web Administrator	$ 68,750 - $106,250	$ 70,750 - $111,500	4.1%
Web Designer	$ 67,000 - $112,250	$ 70,500 - $118,000	5.2%
E-Commerce Analyst	$ 88,000 - $129,500	$ 92,000 - $135,000	4.4%
NETWORKING/TELECOMMUNICATIONS (E)			
Network Architect	$120,000 - $175,000	$125,000 - $183,000	4.4%
Network Manager	$100,000 - $146,750	$102,250 - $153,000	3.4%
Network Engineer	$ 96,000 - $138,750	$ 99,000 - $146,250	4.5%
Wireless Network Engineer	$108,750 - $150,750	$113,250 - $158,000	4.5%
Network Administrator	$ 76,250 - $112,000	$ 78,000 - $117,750	4.0%
Pre-Sales Engineer/Technical Engineer	$ 90,750 - $132,750	$ 92,250 - $140,000	3.9%
Telecommunications Manager	$ 88,500 - $125,000	$ 90,000 - $130,000	3.0%
Telecommunications Specialist	$ 61,000 - $ 95,500	$ 63,000 - $ 98,000	2.9%
OPERATIONS			
Manager	$ 66,250 - $ 96,250	$ 68,000 - $ 99,000	2.8%
Computer Operator	$ 35,000 - $ 48,750	$ 36,000 - $ 50,000	2.7%
Mainframe Systems Programmer	$ 62,750 - $ 86,500	$ 64,000 - $ 89,500	2.8%

(D) Add the percentage below, based on national averages, to IT salaries for the following skills:

AJAX (Asynchronous JavaScript and XML)
  development skills 5%
ASP development skills 4%
C# development skills 7%
ColdFusion development skills 4%
Content management system (CMS) skills 4%
DCOM/COM/ActiveX development skills 4%
Java development skills 8%
Java EE/J2EE development skills 8%
LAMP (Linux, Apache, MySQL and
  Perl/PHP/Python) skills 7%
.NET development skills 7%

PHP development skills 7%
Python skills 6%
Ruby on Rails skills...................................... 6%
SharePoint skills.. 8%
Virtualization skills 7%
Web services development skills.................... 7%

(E) Add the percentage below, based on national averages, to IT salaries for the following skills:

Cisco network administration skills 7%
LINUX/UNIX administration skills................... 7%
Voice over Internet Protocol (VoIP)
  administration skills 5%
Windows 10 skills 4%

TECHNOLOGY SALARIES: UNITED STATES

Title	2016	2017	% Change
SECURITY (F)			
Data Security Analyst	$113,500 - $160,000	$118,250 - $169,000	5.0%
Systems Security Administrator	$105,500 - $149,500	$110,500 - $157,500	5.1%
Network Security Administrator	$103,250 - $147,000	$107,750 - $155,250	5.1%
Network Security Engineer	$110,250 - $152,750	$115,500 - $162,500	5.7%
Information Systems Security Manager	$129,750 - $182,000	$136,000 - $191,750	5.1%
SOFTWARE DEVELOPMENT (G)			
Product Manager	$105,750 - $152,750	$107,750 - $159,000	3.2%
Software Engineer	$103,000 - $156,250	$108,250 - $164,500	5.2%
Software Developer	$ 91,000 - $145,250	$ 93,000 - $155,000	5.0%
TECHNICAL SERVICES, HELP DESK & TECHNICAL SUPPORT (H)			
Manager	$ 84,500 - $121,000	$ 86,000 - $125,500	2.9%
Desktop Support Analyst	$ 54,250 - $ 80,500	$ 55,250 - $ 82,500	2.2%
Systems Administrator	$ 67,500 - $107,500	$ 69,000 - $112,000	3.4%
Systems Engineer	$ 85,000 - $124,000	$ 86,500 - $130,000	3.6%
Messaging Administrator	$ 74,000 - $111,750	$ 76,000 - $116,000	3.4%
Help Desk Tier 3	$ 59,500 - $ 77,750	$ 61,000 - $ 80,500	3.1%
Help Desk Tier 2	$ 45,250 - $ 61,750	$ 46,250 - $ 64,000	3.0%
Help Desk Tier 1	$ 35,000 - $ 50,250	$ 36,000 - $ 51,750	2.9%
Instructor/Trainer	$ 56,250 - $ 90,000	$ 57,250 - $ 92,250	2.2%
PC Technician	$ 36,000 - $ 51,750	$ 37,000 - $ 53,500	3.1%
Business Continuity Analyst	$ 97,250 - $140,000	$ 99,000 - $148,000	4.1%

(F) Add the percentage below, based on national averages, to IT salaries for the following skills:

Certified Information Systems Security
 Professional (CISSP) 6%
Check Point Firewall administration skills 6%
Cisco network administration skills 7%
LINUX/UNIX administration skills 7%

(G) Add the percentage below, based on national averages, to IT salaries for the following skills:

ASP development skills 4%
C# development skills 7%
C++ development skills 4%
DCOM/COM/ActiveX development skills 4%

Hadoop skills 7%
Java development skills 8%
Java EE/J2EE development skills 8%
.NET development skills 7%
PHP development skills 7%
Web services development skills 7%

(H) Add the percentage below, based on national averages, to IT salaries for the following skills:

Basis administration skills 4%
Cisco network administration skills 7%
HDI certifications 4%
LINUX/UNIX administration skills 7%
Virtualization skills 7%
Windows 10 skills 4%

LOCAL MARKET VARIANCES: UNITED STATES

The starting salary ranges provided on Pages 9-12 reflect the national averages for each position.

To determine the estimated salary range for a position in your area:

1 Locate your city's variance number on Pages 14-15.

2 Move the decimal point in the variance number two places to the left.

3 Multiply this figure by the low and high ends of the position's national salary range.

For the latest news and updates on technology salaries, visit our Salary Center at **rht.com/salary-center**.

Get a personalized salary calculation

rht.com/salary-calculator

ALABAMA
Birmingham 95.0
Huntsville 94.0
Mobile 86.0

ARIZONA
Phoenix 112.5
Tucson 104.5

ARKANSAS
Fayetteville 95.0
Little Rock 95.0

CALIFORNIA
Fresno 90.0
Irvine 128.0
Los Angeles 130.0
Oakland 129.0
Ontario 119.0
Sacramento 103.5
San Diego 125.0
San Francisco 140.0
San Jose 137.0
Santa Barbara 127.0
Santa Rosa/
   Marin 120.0
Stockton 85.0

COLORADO
Boulder 116.5
Colorado Springs . 95.3
Denver 107.0
Fort Collins 97.0
Greeley 88.0
Loveland 94.0
Pueblo 82.0

CONNECTICUT
Hartford 116.5
New Haven 112.0
Stamford 131.0

DELAWARE
Wilmington 105.0

DISTRICT OF COLUMBIA
Washington 133.0

FLORIDA
Fort Myers 90.5
Jacksonville 95.0
Melbourne 90.5
Miami/
   Fort Lauderdale . 107.0
Orlando 100.0
St. Petersburg 96.5
Tampa 98.5
West Palm
   Beach 100.5

GEORGIA
Atlanta 103.0
Macon 82.0
Savannah 84.0

HAWAII
Honolulu 107.0

IDAHO
Boise 86.1

ILLINOIS
Chicago 123.0
Naperville 112.0
Rockford 85.0

INDIANA
Fort Wayne 83.0
Indianapolis 96.0

IOWA
Cedar Rapids 94.0
Davenport 95.0
Des Moines 100.0
Sioux City 84.0
Waterloo/
   Cedar Falls 87.0

KANSAS
Overland Park 100.5

KENTUCKY
Lexington 91.5
Louisville 92.0

LOUISIANA
Baton Rouge 99.0
New Orleans 99.0

MAINE
Portland 95.0

MARYLAND
Baltimore 103.0

MASSACHUSETTS
Boston 133.0
Springfield 101.0

MICHIGAN
Ann Arbor 101.5
Detroit 100.0
Grand Rapids 85.5
Kalamazoo 80.0
Lansing 85.0

MINNESOTA

Bloomington 105.5
Duluth 79.6
Minneapolis 106.0
Rochester 101.0
St. Cloud 82.5
St. Paul 103.0

MISSOURI

Kansas City 99.5
St. Joseph 90.0
St. Louis 99.0

NEBRASKA

Omaha 97.0

NEVADA

Las Vegas 99.0
Reno 100.0

NEW HAMPSHIRE

Manchester/
  Nashua 112.0

NEW JERSEY

Mount Laurel 115.0
Paramus 130.0
Princeton 125.0
Woodbridge 126.5

NEW MEXICO

Albuquerque 91.5

NEW YORK

Albany 99.0
Buffalo 95.0
Long Island 120.0
New York 140.5

Rochester 91.7
Syracuse 90.3

NORTH CAROLINA

Charlotte 101.5
Greensboro 100.0
Raleigh 104.0

OHIO

Akron 89.0
Canton 82.0
Cincinnati 97.5
Cleveland 96.0
Columbus 98.0
Dayton 87.0
Toledo 85.5
Youngstown 76.0

OKLAHOMA

Oklahoma City 93.0
Tulsa 93.0

OREGON

Portland 106.5

PENNSYLVANIA

Harrisburg 95.0
Philadelphia 115.0
Pittsburgh 98.0

RHODE ISLAND

Providence 101.5

SOUTH CAROLINA

Charleston 93.5
Columbia 93.5
Greenville 92.0

SOUTH DAKOTA

Sioux Falls 84.0

TENNESSEE

Chattanooga 89.0
Cool Springs 100.0
Knoxville 89.0
Memphis 95.0
Nashville 100.5

TEXAS

Austin 108.0
Dallas 109.0
El Paso 72.0
Fort Worth 108.0
Houston 107.0
Midland/Odessa . 110.0
San Antonio 101.0

UTAH

Salt Lake City 104.0

VIRGINIA

Norfolk/Hampton
  Roads 97.0
Richmond 98.5
Tysons Corner 132.0

WASHINGTON

Seattle 120.0
Spokane 82.0

WISCONSIN

Appleton 85.0
Green Bay 86.5
Madison 98.5
Milwaukee 101.0
Waukesha 99.0

Source: U.S. Department of Labor's Bureau of Labor Statistics and Robert Half Technology. City index figures are reflective of all industries and are not specific to the technology field. Please contact a Robert Half Technology account executive for salary information regarding cities not listed in the guide.

HIRING OUTLOOK FOR CANADA

Network security and big data initiatives are driving demand for IT professionals within Canadian businesses. Healthcare, finance, high-tech and software organizations are among the top industries seeking skilled technology talent for their teams.

Much like U.S. firms, Canadian employers are taking a strategic approach to full-time and contract hiring while still moving quickly to avoid losing out on top talent. The most prized candidates not only have specialized technical skills, but also possess business acumen and strong soft skills. Developers, as well as network security and database professionals, are in especially high demand.

68%
of CIOs in Canada say it's challenging to find skilled IT professionals today.

Source: Robert Half Technology survey of more than 270 CIOs in Canada

For more
Canadian hiring and
compensation resources

roberthalftechnology.ca/salary-centre

TECHNOLOGY SALARIES: CANADA

Title	2016	2017	% Change
ADMINISTRATION			
Chief Information Officer (CIO)	$165,500 - $245,000	$167,250 - $251,500	2.0%
Chief Technology Officer (CTO)	$149,250 - $219,250	$152,250 - $224,000	2.1%
Chief Security Officer (CSO)	$146,750 - $234,750	$151,500 - $241,750	3.1%
Vice President of Information Technology	$159,000 - $235,250	$161,500 - $240,250	1.9%
Director of Technology	$120,000 - $155,250	$123,000 - $158,500	2.3%
Information Technology Manager	$109,250 - $152,750	$111,000 - $156,750	2.2%
APPLICATIONS DEVELOPMENT (A)			
Manager	$116,000 - $152,500	$118,000 - $157,000	2.4%
Project Manager	$ 99,750 - $154,750	$100,750 - $158,750	2.0%
Systems Analyst	$ 84,500 - $113,000	$ 85,500 - $116,500	2.3%
Applications Architect	$115,750 - $151,500	$117,750 - $156,250	2.5%
Business Systems Analyst	$ 94,750 - $130,000	$ 96,500 - $133,750	2.4%
CRM Business Analyst	$ 92,500 - $120,000	$ 94,500 - $123,250	2.5%
CRM Technical Developer	$ 93,500 - $126,250	$ 96,500 - $131,250	3.6%
Developer/Programmer Analyst	$ 85,000 - $125,000	$ 86,000 - $129,750	2.7%
ERP Business Analyst	$ 99,750 - $131,750	$103,750 - $135,750	3.5%
ERP Technical/Functional Analyst	$103,000 - $149,250	$104,000 - $152,500	1.7%
ERP Technical Developer	$107,500 - $152,500	$111,000 - $155,000	2.3%
Lead Applications Developer	$105,750 - $143,250	$111,000 - $147,000	3.6%
Mobile Applications Developer	$ 99,750 - $143,500	$100,750 - $149,000	2.7%
Technical Writer	$ 53,000 - $ 83,750	$ 56,750 - $ 86,250	4.6%

(A) Add the percentage below, based on national averages, to IT salaries for the following skills:

AJAX (Asynchronous JavaScript and XML)
 development skills 2%
Business Objects skills 4%
C# development skills 6%
C++ development skills 5%
Hyperion skills 3%

Java development skills 6%
Java EE/J2EE development skills 6%
LAMP (Linux, Apache, MySQL and
 Perl/PHP/Python) skills 6%
.NET development skills 7%
PHP development skills 7%
SAP development skills 6%
SharePoint skills 6%

All salaries listed on Pages 17-20 are in Canadian dollars.

Title	2016	2017	% Change
CONSULTING & SYSTEMS INTEGRATION			
Director	$123,250 - $167,750	$127,250 - $174,000	3.5%
Practice Manager	$108,000 - $158,750	$111,250 - $162,000	2.4%
Project Manager/Senior Consultant	$103,000 - $157,500	$105,750 - $160,000	2.0%
Staff Consultant	$ 66,750 - $ 93,000	$ 70,000 - $ 96,500	4.2%
Senior IT Auditor	$119,000 - $184,250	$125,000 - $194,500	5.4%
IT Auditor	$ 94,500 - $123,000	$ 99,000 - $129,000	4.8%
DATA/DATABASE ADMINISTRATION (B)			
Big Data Engineer	$117,000 - $150,500	$123,000 - $158,000	5.0%
Database Manager	$110,500 - $156,250	$112,500 - $159,750	2.1%
Database Developer	$ 96,000 - $126,250	$ 97,000 - $131,000	2.6%
Database Administrator	$ 90,000 - $120,250	$ 91,000 - $125,000	2.7%
Data Analyst/Report Writer	$ 78,500 - $110,000	$ 79,500 - $113,000	2.1%
Data Architect	$116,000 - $160,500	$119,000 - $164,000	2.4%
Data Modeler	$ 99,000 - $130,000	$102,000 - $134,500	3.3%
Data Scientist	$ 96,750 - $127,250	$ 99,500 - $132,000	3.3%
Data Warehouse Manager	$105,000 - $150,500	$109,000 - $155,000	3.3%
Data Warehouse Analyst	$ 98,250 - $138,500	$ 99,000 - $142,500	2.0%
Business Intelligence Analyst	$ 94,750 - $127,250	$ 97,000 - $132,500	3.4%
Electronic Data Interchange (EDI) Specialist	$ 77,750 - $106,750	$ 81,750 - $112,000	5.0%
Portal Administrator	$ 75,500 - $104,250	$ 78,250 - $107,500	3.3%
QUALITY ASSURANCE (QA) & TESTING (C)			
QA Engineer – Manual	$ 72,250 - $ 95,000	$ 73,750 - $ 96,500	1.8%
QA Engineer – Automated	$ 78,000 - $102,750	$ 80,750 - $105,500	3.0%
QA/Testing Manager	$ 88,000 - $113,500	$ 90,000 - $115,000	1.7%
QA Associate/Analyst	$ 71,750 - $ 97,500	$ 73,000 - $ 98,500	1.3%

(B) Add the percentage below, based on national averages, to IT salaries for the following skills:

ETL skills 6%
Hadoop... 8%
Microsoft SQL Server database skills 7%
Oracle database skills 7%

(C) Add the percentage below, based on national averages, to IT salaries for the following skills:

Performance testing (e.g., Mercury
  Interactive Tools) skills................................ 3%

Title	2016	2017	% Change
WEB DEVELOPMENT (D)			
Senior Web Developer	$100,250 - $132,000	$102,250 - $135,000	2.2%
Web Developer	$ 76,750 - $105,000	$ 77,500 - $107,500	1.8%
Front-End Web Developer	$ 75,250 - $ 99,750	$ 77,000 - $102,750	2.7%
Web Administrator	$ 70,000 - $ 94,250	$ 71,000 - $ 97,000	2.3%
Web Designer	$ 78,000 - $106,250	$ 79,250 - $109,000	2.2%
E-Commerce Analyst	$ 79,750 - $110,750	$ 83,000 - $114,500	3.7%
NETWORKING/TELECOMMUNICATIONS (E)			
Network Architect	$105,750 - $161,000	$107,750 - $166,750	2.9%
Network Manager	$ 92,000 - $122,000	$ 94,000 - $126,250	2.9%
Network Engineer	$ 93,500 - $123,000	$ 96,000 - $127,000	3.0%
Wireless Network Engineer	$104,000 - $136,000	$108,000 - $141,500	4.0%
Network Administrator	$ 75,000 - $ 99,000	$ 76,750 - $102,250	2.9%
Pre-Sales Engineer/Technical Engineer	$ 97,500 - $123,000	$100,000 - $126,000	2.5%
Telecommunications Manager	$ 97,500 - $126,500	$101,500 - $131,500	4.0%
Telecommunications Specialist	$ 68,750 - $ 96,250	$ 70,750 - $ 99,250	3.0%
OPERATIONS			
Manager	$ 82,250 - $ 99,000	$ 84,000 - $102,000	2.6%
Computer Operator	$ 43,500 - $ 57,250	$ 45,500 - $ 60,250	5.0%
Mainframe Systems Programmer	$ 66,500 - $ 93,000	$ 67,750 - $ 96,000	2.7%

(D) Add the percentage below, based on national averages, to IT salaries for the following skills:

AJAX (Asynchronous JavaScript and XML)
  development skills 2%
ASP development skills 3%
C# development skills 6%
ColdFusion development skills 2%
Content management system (CMS) skills 6%
DCOM/COM/ActiveX development skills 3%
Java development skills 6%
Java EE/J2EE development skills 6%
LAMP (Linux, Apache, MySQL and
  Perl/PHP/Python) skills 6%
.NET development skills 7%

PHP development skills 7%
Python skills 5%
Ruby on Rails skills 6%
SharePoint skills 6%
Virtualization skills 7%
Web services development skills 7%

(E) Add the percentage below, based on national averages, to IT salaries for the following skills:

Cisco network administration skills 7%
LINUX/UNIX administration skills 6%
Voice over Internet Protocol (VoIP)
  administration skills 6%
Windows 10 skills 4%

Title	2016	2017	% Change
SECURITY (F)			
Data Security Analyst	$105,250 - $157,250	$109,250 - $162,000	3.3%
Systems Security Administrator	$ 92,000 - $127,250	$ 96,750 - $135,250	5.8%
Network Security Administrator	$ 98,500 - $138,500	$101,000 - $144,500	3.6%
Network Security Engineer	$106,000 - $142,250	$110,750 - $150,250	5.1%
Information Systems Security Manager	$115,250 - $152,500	$120,250 - $160,500	4.9%
SOFTWARE DEVELOPMENT (G)			
Product Manager	$110,750 - $147,000	$111,000 - $152,000	2.0%
Software Engineer	$ 95,500 - $140,000	$ 99,750 - $145,000	3.9%
Software Developer	$ 82,750 - $122,500	$ 85,000 - $128,500	4.0%
TECHNICAL SERVICES, HELP DESK & TECHNICAL SUPPORT (H)			
Manager	$ 90,250 - $122,750	$ 93,250 - $126,000	2.9%
Desktop Support Analyst	$ 59,250 - $ 82,500	$ 60,000 - $ 85,000	2.3%
Systems Administrator	$ 72,000 - $ 99,250	$ 75,500 - $104,000	4.8%
Systems Engineer	$ 85,000 - $110,500	$ 86,500 - $114,750	2.9%
Messaging Administrator	$ 73,000 - $ 95,000	$ 76,500 - $ 98,750	4.3%
Help Desk Tier 3	$ 69,750 - $ 93,250	$ 72,250 - $ 96,250	3.4%
Help Desk Tier 2	$ 55,000 - $ 69,000	$ 57,000 - $ 72,000	4.0%
Help Desk Tier 1	$ 43,250 - $ 55,000	$ 44,500 - $ 58,250	4.6%
Instructor/Trainer	$ 59,750 - $ 80,750	$ 62,500 - $ 84,500	4.6%
PC Technician	$ 50,000 - $ 70,750	$ 52,000 - $ 73,000	3.5%
Business Continuity Analyst	$ 82,000 - $118,250	$ 86,750 - $124,250	5.4%

(F) Add the percentage below, based on national averages, to IT salaries for the following skills:

Certified Information Systems Security
Professional (CISSP).....................................7%
Check Point Firewall administration skills 6%
Cisco network administration skills 7%
LINUX/UNIX administration skills 6%

(G) Add the percentage below, based on national averages, to IT salaries for the following skills:

ASP development skills..................................3%
C# development skills 6%
C++ development skills 5%
DCOM/COM/ActiveX development skills 3%

Hadoop skills 8%
Java development skills.................................6%
Java EE/J2EE development skills 6%
.NET development skills 7%
PHP development skills 7%
Web services development skills....................7%

(H) Add the percentage below, based on national averages, to IT salaries for the following skills:

Basis administration skills 3%
Cisco network administration skills 7%
HDI certifications..4%
LINUX/UNIX administration skills...................6%
Virtualization skills 7%
Windows 10 skills 4%

LOCAL MARKET VARIANCES: CANADA

The starting salary ranges provided on Pages 17-20 reflect the national averages for each position.

To determine the estimated salary range for a position in your area:

1 Locate your city's variance number on this page.

2 Move the decimal point in the variance number two places to the left.

3 Multiply this figure by the low and high ends of the position's national salary range.

ALBERTA
Calgary 102.9
Edmonton 101.8

BRITISH COLUMBIA
Fraser Valley. 100.2
Vancouver 104.9
Victoria 96.8

MANITOBA
Winnipeg 91.0

ONTARIO
Kitchener-Waterloo. 96.3
Ottawa 100.2
Toronto 104.9

QUEBEC
Montreal 102.9
Quebec City. 90.0

SASKATCHEWAN
Regina. 93.9
Saskatoon 95.5

Get a personalized salary calculation

roberthalftechnology.ca/salary-calculator

City index figures are reflective of all industries and are not specific to the technology field. Please contact a Robert Half Technology account executive for salary information regarding cities not listed in the guide.

THE CAREER CITY INDEX:
MAKING THE MOST OF LOCATION

To career-minded professionals, what makes one city more attractive than another? The answer may help hiring managers develop and refine their recruitment strategies.

The Career City Index — a result of a study conducted by The Economist Intelligence Unit for Robert Half — examines key factors influencing livability and career opportunities in various U.S. cities across four categories:

- Career prospects
- Quality of life
- Cost of living
- Cultural diversity

TOP 5 CITIES TO LIVE AND WORK IN

1 Seattle

2 Boston

These factors include employment outlook, average commute time, median monthly rent and internet connectivity, among others.

Seattle took the overall No. 1 position as the top career city in the United States, buoyed by strong rankings in the cost-of-living (first) and career-prospects (second) categories. Boston, the San Francisco Bay Area, the District of Columbia and Raleigh, North Carolina, rounded out the top five.

From sunshine in Phoenix and Sacramento, California, to the wide variety of restaurants in Los Angeles and New York to shorter commute times in Salt Lake City and Des Moines, Iowa, each of the top 25 cities has unique selling points. The Career City Index helps companies highlight these local and regional factors to pique the interest of prospective employees.

*All cities, including those not featured in the study, have their own set of attractions for potential employees. Visit **rht.com** for more information that can help you recruit top technology talent in your city.*

For the full report, visit **roberthalf.com/career-city-index**.

3
San Francisco

4
Washington, D.C.

5
Raleigh

TOP SKILLS AND CERTIFICATIONS EMPLOYERS SEEK

Specific requirements for technology roles vary across industries and regions. However, these are some of the skills and certifications in especially high demand by organizations throughout North America:

37%

of CIOs say staying up to date on industry trends is the greatest source of pressure on IT professionals.

Source: Robert Half Technology survey of more than 2,500 CIOs in the United States

- ASP
- C#
- Cisco Certified Internetwork Expert (CCIE)
- Cisco Certified Network Associate (CCNA)
- CompTIA A+
- Java
- Microsoft SQL Server
- MySQL
- .NET

Employers are placing more emphasis on soft skills when hiring. In particular, they are seeking professionals who can work well with both internal teams and outside vendors. Leadership abilities are also valued, as many IT professionals hired for full-time roles are expected to guide project teams and consultants through major technology initiatives.

CIOs were asked:

In which one of the following areas would you say today's technology professionals could most use improvement?

Their responses:

%	Area
28%	Communication skills, including written, interpersonal and face-to-face communication
21%	Problem-solving skills
18%	Work ethic, including accountability and reliability
13%	Creative thinking
9%	Professionalism
8%	Business acumen
3%	Other/ don't know

10%   20%   30%

Source: Robert Half Technology survey of more than 2,500 CIOs in the United States
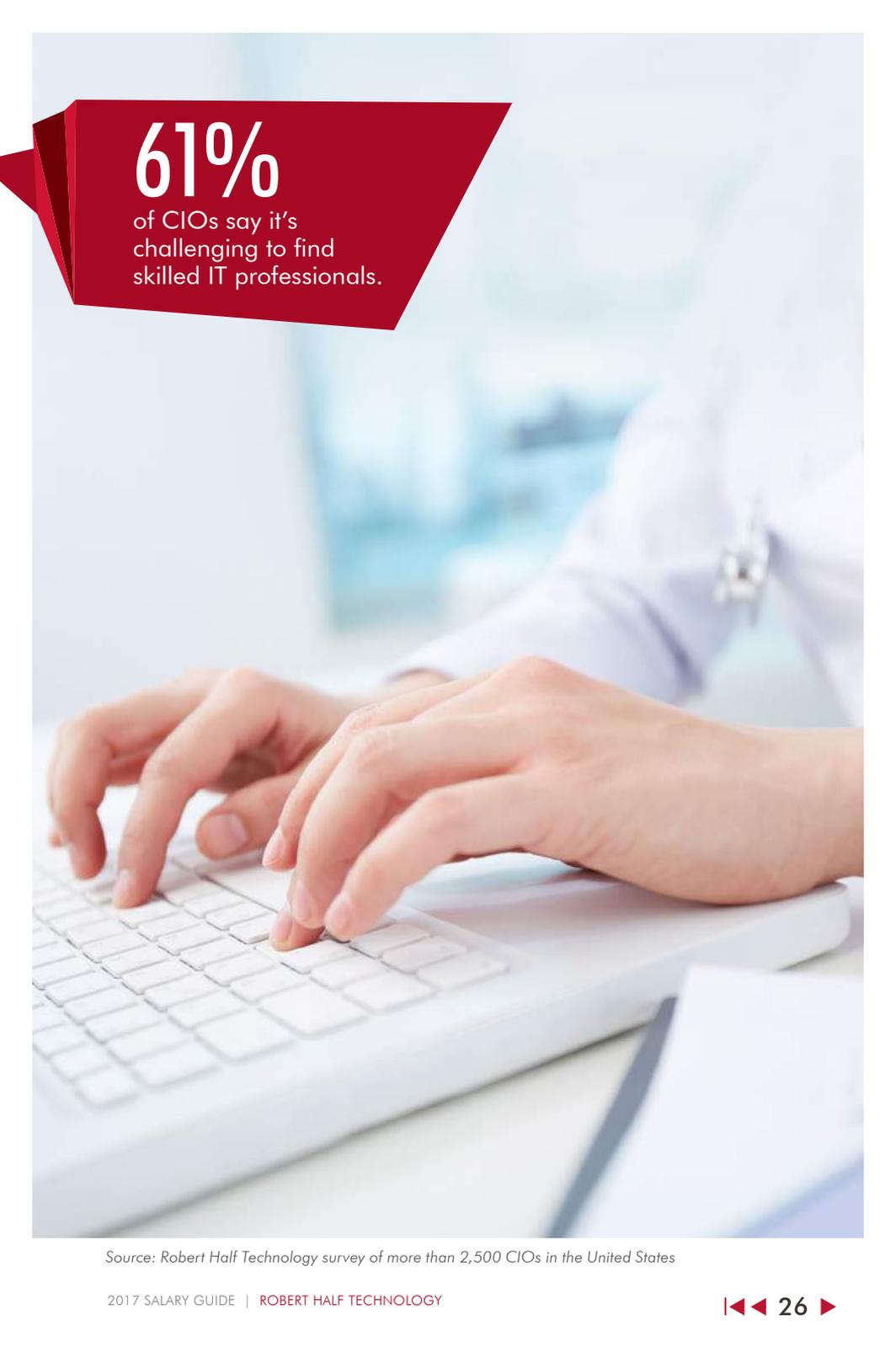
61%

of CIOs say it's challenging to find skilled IT professionals.

Source: Robert Half Technology survey of more than 2,500 CIOs in the United States

INDUSTRIES TO WATCH IN 2017

According to the U.S. Department of Labor's Bureau of Labor Statistics, technology roles within the healthcare industry are expected to be one of the fastest-growing occupational groups from 2014 to 2024.

HEALTHCARE

Many healthcare organizations are modernizing their operations and investing in new technologies to meet regulatory compliance demands, increase efficiency and promote innovation.

New ways of providing patient care, such as mobile health, are also driving the need for IT expertise in the industry.

FINANCIAL SERVICES

Financial organizations are expanding online banking and brokerage services and increasing other technology-enabled services to support customers. There is also strong demand in the sector for experienced technology professionals who can support big data and information security initiatives.

4 TIPS FOR BECOMING A TECH TALENT MAGNET

Companies that want to attract — and retain — highly skilled technology professionals in today's market should consider offering the following incentives, in addition to competitive compensation:

1   **Work-from-home arrangements.** Many IT professionals, especially those working in areas where long commutes undermine work-life balance, seek the opportunity to telecommute. If remote work isn't an option, consider offering flexible schedules.

2   **The opportunity to contribute to multiple projects.** Most talented tech professionals don't want to be tied to just one type of work. Allow them to lend their expertise to various initiatives that interest them so they can build on existing skills and develop new ones.

3   **The ability to innovate.** Encourage IT workers to propose new ideas and take the lead on developing solutions that help the company operate more efficiently. Empowering team members to take the initiative on business-critical tasks will only strengthen their loyalty.

4   **A clear path of development.** Starting at the job interview, show in-demand technology candidates how they can grow with, and ascend in, the organization over the long term. Take into account aspiring managers and non-managers alike, and assure team members that their career path is a priority.

55%

of CIOs are concerned about being able to retain their current staff members.

For insights on workplace trends, career advice and tips for hiring and retaining the best talent, visit our blog at **rht.com/blog**.

Source: Robert Half Technology survey of more than 2,500 CIOs in the United States

ABOUT ROBERT HALF TECHNOLOGY

Robert Half Technology is a division of Robert Half, the world's first and largest specialized staffing firm.

Robert Half Technology matches the staffing needs of growing companies with skilled technology professionals who seek exceptional career opportunities. We provide access to IT professionals, offering a full spectrum of services — from project, contract-to-hire and full-time IT staffing services to managed services and solution consulting.

Our staffing experts are available for personal consultation to help you locate top technology professionals who are motivated to perform and well-suited to your workplace culture. We also offer a wealth of management and career advice on our website and blog and in white papers.

TOP 8 REASONS COMPANIES USE SPECIALIZED STAFFING FIRMS

1 To vastly expand their recruiting networks

2 To tap job seekers not actively looking for opportunities but open to a change

3 To bring in critical talent on short notice

4 To get help when they don't have the time to conduct a rigorous search and evaluation of their own

5 To staff limited-duration projects that don't require a full-time employee

6 To lighten the load on overworked staff

7 To reduce overtime expenses caused by understaffing

8 To provide support for core employees temporarily assigned to special projects

Contact Robert Half Technology at **rht.com** or **1.844.380.8636** to learn more about salaries in your market and how we can help you find the right talent for your organization.

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Colorado Springs
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Columbia**
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Orlando
Tampa

Georgia
Atlanta

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Oakbrook Terrace

Indiana
Indianapolis

Iowa
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Des Moines

Kansas
Overland Park

Kentucky
Louisville

Louisiana
New Orleans

Maryland
Baltimore
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Massachusetts
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Michigan
Grand Rapids
Southfield

Minnesota
Bloomington
Minneapolis

Missouri
St. Louis

Nevada
Las Vegas

New Hampshire
Manchester

New Jersey
Parsippany
Princeton
Saddle Brook
Woodbridge

New Mexico
Albuquerque

New York
New York – Midtown
New York – Wall Street
Uniondale

North Carolina
Charlotte
Raleigh

Ohio
Akron
Blue Ash
Cincinnati
Cleveland
Dayton
Dublin

Oklahoma
Oklahoma City
Tulsa

Oregon
Portland

Pennsylvania
King of Prussia
Philadelphia
Pittsburgh

Rhode Island
Providence

South Carolina
Charleston
Greenville

Tennessee
Memphis
Nashville

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Austin
Dallas – Downtown
Dallas – Galleria
Fort Worth
Houston – West
San Antonio
The Woodlands

Utah
Salt Lake City
Thanksgiving Point

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Richmond
Tysons Corner

Washington
Bellevue
Seattle

Wisconsin
Madison
Milwaukee

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