SAGE System Administrator Salary Profile 1999

Prepared for

USENIX/SAGE

by

Human Resources Research Organization (HumRRO)
Alexandria, Virginia

For more information, contact SAGE at 510.528.8649 or by email at office@sage.org.

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

EXECUTIVE SUMMARY

SAGE, The System Administrators Guild, is a Special Technical Group of the USENIX Association. USENIX is the UNIX and advanced computing systems technical and professional association. SAGE is organized to advance the status of computer system administration as a profession, establish standards of professional excellence and recognize those who attain them, develop guidelines for improving the technical and managerial capabilities of members of the profession, and promote activities that advance the state of the art of the community. As part of its ongoing effort to gain recognition and advancement for system administrators, SAGE annually conducts a System Administrator Profile Survey. This report is based on results of the 1999 profile that was administered at the LISA Conference and on the USENIX/SAGE website during November and December, 1999.

The 2,314 respondents to the 1999 survey worked in 48 different countries. The majority (81.6%) worked in the U.S. The other most common countries were Canada (5.0%), Australia (3.8%), and the United Kingdom (1.9%). Most analyses on salary, bonuses, and total cash (total cash is salary, wages, bonuses, and other non-deferred cash payments) were based on only the U.S. respondents because of the small sample sizes for other countries.

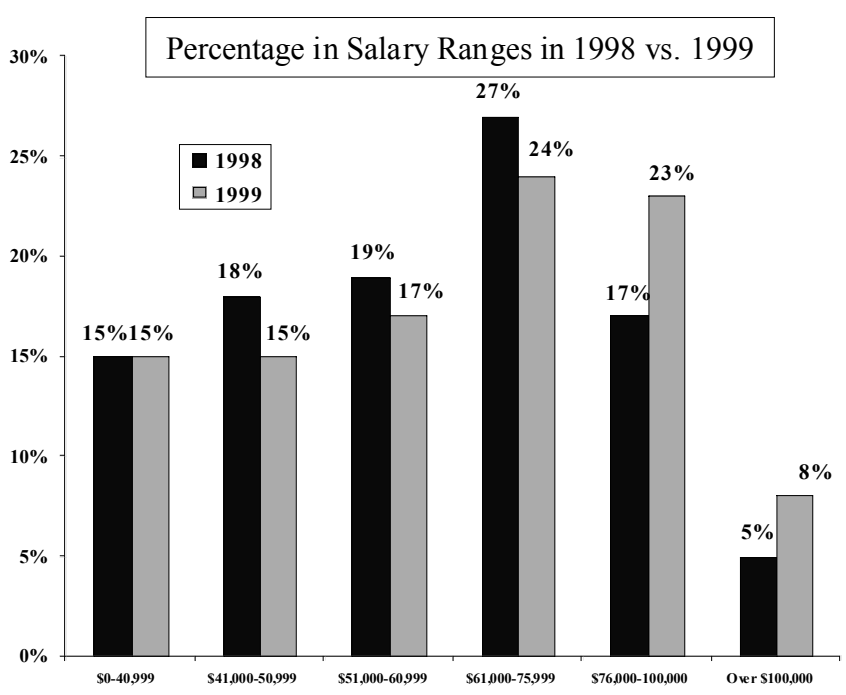
Most respondents were salaried workers (90.1%), working for a single employer (90.9%), male (87.3%), and had a bachelor's degree (46.0%) or some college (21.5%) as their highest level of education. Most worked with Solaris (77.7%), Windows NT (63.7%), Linux (55.9%), and/or Windows 95/98 (47.8%). On average, respondents worked with 4.7 operating systems. The majority did not supervise any subordinates (72.0%) and were not certified on any operating system (65.4%). They averaged 11.3 days of travel per year, 47.0 hours of work per week, 7.9 years of experience in the field, 2.8 different employers while in the field, and 34 years of age. Half had worked for their current employer two years or less. The majority (89.1%) indicated that system administration was their primary line of work. Over one-fourth of respondents were in the computer/software/internet industry, over 15% worked in university or college education, and over 10% were in consulting/business services.

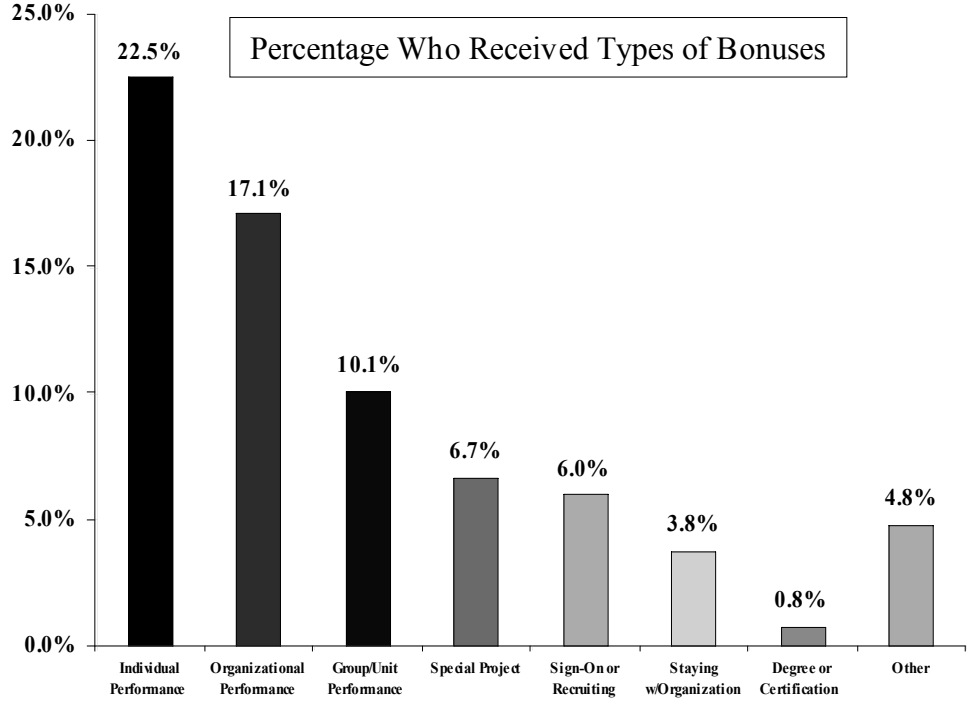
For U.S. system administrators, mean salary was $64,271 and the median was $62,500; mean total cash was $70,565 and the median was $65,200; the mean bonus was $3,464 and the median was zero. Mean and median salaries were lower in other countries and areas of the world than in the U.S., particularly in Eastern Europe/Western Asia. Mean salaries were over $75,000 for two New York City (10 and 11), one North Carolina (28), and the Sacramento and San Francisco area (94 and 95) zip codes.

For those in the U.S., the average 1999 pay increase from the same employer for the same job was 7.9%; from the same employer for a promotion, 14.9%; and from changing employers, 23.3%. Over 61% had received an increase from the same employer for the same job. More than one in six had received an increase from changing employers, and more than one in ten had received a promotional increase.

The graph on the left shows the percentage of respondents for each of the two years who had income in the ranges shown. The percentage with salary less than $41,000 was the same in 1999 (15%) as in 1998 (15%) because the sample included a higher proportion of respondents from outside the U.S. (29.0% in 1999 compared with 14.4% in 1998) where salaries are lower, on average. Percentages in the middle salary ranges decreased, while the percentage making $76,000 or more increased in 1999 (31%) compared to 1998 (22%), which demonstrates the trend of increasing salaries for system administrators.

Over half (52.1%) of the system administrators in the total sample did not receive a bonus. For those who did, the chart on the right shows the percentage of the sample who received each type of bonus. Over 22% received a bonus for individual performance; 17.1% received a bonus for organizational performance, 10.1% for group or unit performance, and 6.7% for a special project. The median bonus for individual and organizational performance was $3,000, for group/unit performance it was $2,000, and for a special project it was $1,500. Of the 21 respondents who reported a bonus related to stock, the median was $27,000.





Eight percent of the system administrators in the sample said they were contractors, and 1.9% said they were independent, self-employed consultants. Mean salary was lower for salaried ($62,152) than contractor ($77,307) or consultant ($96,121) system administrators in the U.S. The same pattern was found for mean total cash, as shown in the table on the top right.

Mean salary for those who "assist in the administration of a systems facility" and "perform routine tasks under the direct supervision of a more experienced system administrator" (Level 1 of the four SAGE Job Description Levels) was $47,847. For those at Level 2, who "work under the general supervision of a computer system manager, carrying out more complex tasks with some independence," the mean was $54,765. For those at Level 3, who "initiate some new responsibilities and help to plan for the future of the facility," "manage the work of novice system administrators," and "evaluate and/or recommend purchases" the mean was $61,703. And for those at Level 4, who "design and manage the computing infrastructure," "work under general direction from senior management," and "establish or recommend policies on system use and services" the mean was $71,725. The same pattern of relationship between increasing level and increasing pay is seen for total cash in the table on the bottom right.

In the U.S., supervision of subordinates was related to the following average salaries: no subordinates, $62,448; 1 to 2, $63,297; 3 to 5, $67,779; 6 to 10, $70,044; and 11 or more, $78,168.

For U.S. system administrators, salary also tended to increase with hours worked (e.g., $41,848 average for 0-19 hours; $54,449 for 20-34 hours; $62,900 for 41-45 hours; $66,156 for 51 to 60 hours).

Total Cash in 1999 by Type of Primary Job
(U.S. system administrators)

Job Type	Number of Respondents	Mean Total Cash in U.S. Dollars
Salaried	1,470	$68,742
Contractor	135	$78,346
Independent, self-employed consultant	24	$106,746

Total Cash in 1999 by SAGE Job Description Level
(U.S. system administrators)

Job Level	Number of Respondents	Mean Total Cash in U.S. Dollars
Level 1	43	$50,766
Level 2	181	$57,806
Level 3	851	$66,578
Level 4	554	$81,021
Mean for All Levels	1,629	$70,098

For U.S. system administrator respondents, 15.4% reported receiving overtime pay, 10.1% shift pay, and 15.9% on-call/pager pay. Overtime pay for U.S. system administrators was most prevalent in aerospace, government, and the military. Shift pay was most prevalent in the aerospace industry and federal government (non-military). Over one-quarter of U.S. respondents in health care, state/local government, and transportation organizations said they get paid for being on call or wearing a pager.

Number of operating systems supported was not related to amount of pay, but those who worked with Solaris, BSDI, and HP-UX tended to have significantly higher salaries, while those who worked with Free BSD, Macos (non-Unix), Open BSD, or DOS/Win 3.1 tended to have lower salaries, on average. About a third of the sample (34.5%) had a certification for an operating system. Those with certifications for HP-UX, Solaris, and SunOS tended to earn more salary or total cash. Other operating systems and certifications, including Linux, Windows NT, did not have a statistically significant relationship with the amount of salary or total cash earned.

As shown in the table on the left, U.S. system administrators with high school as their highest level of education averaged $58,055 in salary, while those with increasingly higher levels of education made increasingly higher average salaries. The number of certifications one had earned was related to salary in the U.S.: those with no certifications averaged $62,992 in salary; those with one certification averaged $64,116; and those with six or more averaged $71,322. Members of SAGE tended to make more salary ($65,818, on average) and total cash ($73,990, on average) than those who were not members of a professional organization (average $61,637 in salary and $65,226 in total cash). As shown in the table on the bottom right, male system administrators reported higher average salary and total cash than the female system administrator respondents from the U.S. Regression equations including variables such as education, years of experience, and job level along with sex indicated that females make lower salaries, but higher bonuses, on average, and do not have significantly lower total cash when the other variables are taken into account.

1999 Salary by Level of Education
(U.S. system administrators)

Level of Education	Number of Respondents	Mean Salary in U.S. Dollars
Certificate	6	$46,050
High School	44	$58,055
Some Technical School	77	$60,533
Some College	383	$61,076
Associate's Degree	123	$61,585
Bachelor's Degree	770	$64,641
Master's Degree	237	$67,998
Ph.D.	20	$72,160

1999 Salary and Total Cash by Sex
(U.S. system administrators)

Sex of Respondent	Number of Respondents	Mean Salary in U.S. Dollars	Mean Total Cash in U.S. Dollars
Male	1,435	$64,883	$71,214
Female	225	$57,777	$62,863

Years of experience as a system administrator (or in similar work) was positively related to higher salaries and total cash (see the table on the bottom left), but years with one's current employer were not. Those with two years or less experience averaged less than $50,000 salary; those with 3 to 10 years averaged between $50,000 and $60,000; those with 11 to 14 years averaged between $70,000 and $75,000; and those with over 15 years averaged more than $76,000. Age was also positively related to compensation, although the relationship was not as strong as that between years of experience and compensation.

The table on the right illustrates how U.S. system administrators' compensation was positively related to the number of employers they had had during their career. This was not because those who had had more employers also had more experience; nor was it due to the fact that those with more employers were more likely to be contractors or consultants. In addition, those who worked for more than one employer at the time of the survey (i.e., more than one at the same time) averaged about $5,000 more salary ($68,573 vs. $63,463) and about $6,000 more total cash ($75,622 vs. $69,589) than those with one employer.

Salary by Years of Experience
(U.S. system administrators)

Years of Experience	Number of Respondents	Mean Salary in U.S. Dollars
1 or less	58	$38,163
2	90	$46,178
3	138	$54,288
4	159	$55,508
5	204	$60,246
6	145	$63,643
7-8	224	$67,814
9-10	196	$67,510
11-12	142	$72,167
13-14	83	$74,749
15-16	109	$76,958
17-20	73	$76,934
21-25	29	$77,950
26 or more	8	$77,780

1999 Salary and Total Cash by Number of Employers
(U.S. system administrators)

Number of Employers	Number of Respondents	Mean Salary in U.S. Dollars	Mean Total Cash in U.S. Dollars
1	291	$55,338	$58,460
2	445	$58,925	$62,537
3	419	$65,002	$68,901
4	243	$70,397	$77,853
5	123	$74,876	$83,240
6	55	$71,836	$92,523
7	26	$78,595	$137,815
8 or more	26	$87,667	$108,536

Compensation varied considerably by industry for U.S. system administrators. The median salary was lowest in state or local government ($49,000) and colleges or universities ($50,000) and highest in finance, insurance, and real estate ($71,500) and entertainment ($80,000). These were also the industries with the lowest and highest median total cash, respectively. State/local Government, entertainment,and utilities were among the most generous in providing fully paid insurance, although this varied somewhat by type of insurance.

The numbers of computers supported, users supported, and system administrators employed where one worked were not related to pay levels. The number of computers or users per administrator in one's facility was also not related to compensation.

The number of employees in one's organization, worldwide, was significantly related to salary (see table at right). Salary tended to go up with the number of employees. The mean number of paid holidays, vacation days, and training days, and the percentage with a retirement plan, childcare assistance or tuition assistance also tended to increase with the number of employees in an organization. The percentage who could telecommute or use flextime was lower for those in organizations with 51 to 2,500 employees than in either smaller or larger organizations.

1999 Salary by Organization Size
(U.S. system administrators)

Number of Employees	Percent of Responses	Mean Salary in U.S. Dollars
1	0.5%	$58,788
2-10	1.8%	$48,032
11-50	7.1%	$61,356
51-500	25.9%	$64,174
501-10,000	37.2%	$62,478
10,001 or more	27.5%	$67,941

U.S. system administrators averaged 15.4 days of paid vacation, 11.1 days of paid sick leave, 8.8 paid holidays, and 8.3 days of paid training per year. Paid time off tended to be highest in government, college/university, military, and not-for-profit organizations. Paid training days were highest in the military. The only industry for which U.S. respondents reported a higher percentage of defined benefit (i.e., pension) than defined contribution (e.g., 401k, 403b) retirement plans was state/local government.

The majority (71.9%) of U.S. respondents said that "yes," that their organization does have difficulty filling all of the system administrator positions it would like to fill; 17.9% said "no" and 10.2% said "not sure" to this question. The industries with percentages above 75% were retail and wholesale trade, consulting and business services, federal government-nonmilitary, aerospace, college/university education, and advertising/public relations/communication/marketing. Geographical areas with the highest percentages were San Diego, the Research Triangle of North Carolina, and the San Francisco area.

Over half of respondents said the factors that would be most important in making them think seriously about switching jobs were pay (83.1%), location (76.4%), and benefits (60.0%). Over one-third marked organizational stability (38.9%), hours (38.6%), and organizational reputation (38.3%). (Respondents could mark more than one category.) The majority of respondents (80.1%) said they expect to still be a system administrator in five years.

Respondents were asked to note any special benefits or working conditions they particularly liked and the most problematic or bothersome aspects of their jobs. The following are ranked according to the number of responses (e.g., #1 had the most respondents).

Benefits/Working Conditions That Were Liked	***Most Problematic/Bothersome Aspects of Jobs***
1. Flexible work schedules	1. Poor management
2. Jobs that provide challenge, autonomy, variety, learning	2. Long hours, heavy workloads, or being on call
3. Organizational cultures that are university-like, noncorporate, friendly, or non-bureaucratic	3. Office politics and bureaucracy
4. Good managers, coworkers, and users	4. Low pay or lack of pay for overtime or on call time
5. Equipment for home offices provided by employers	5. Poor resources, low budgets, or lack of help desk support
6. Casual dress or lack of a dress code	6. Routine, unchallenging, menial, or administrative tasks
7. Free beverages and/or food	7. Users not using resources to solve problems themselves
8. Telecommuting	8. Lack of training, career development, and career paths
9. Working with new technology and good resources	9. Understaffing, recruiting and retention problems
10. Good pay, special awards, stock/options, or paid overtime	10. Long commutes, extensive travel, or travel without notice

Regression analysis was used to determine which of the various job, organizational, and personal background characteristics on the survey were most highly related to compensation. Over half (52.0%) of the variance in salary, 23.4% of the variance in total cash, and 8% of the variance in bonuses were accounted for by the equations. Thus, there were more systematic relationships between survey topics and salary than between survey topics and total cash or bonuses. The most significant factors associated with salary were being a consultant or contractor, location, industry, operating systems used, job level, education, number of employers, and experience.

More detailed versions of these data and analyses are available from USENIX/SAGE upon request.

ANALYSES BY COUNTRIES, REGIONS, CITIES, AND ZIP/POSTAL CODES

Respondents worked in 48 different countries. The majority (81.6%) of respondents worked in the U.S. The other most common countries were Canada (5.0%), Australia (3.8%), and the United Kingdom (1.9%).

Country	Number of Respondents	Percent of Respondents
Afghanistan	5	.2
Albania	4	.2
Andorra	2	.1
Australia	88	3.8
Austria	2	.1
Belgium	5	.2
Bermuda	1	.0
Canada	116	5.0
Cape Verde	1	.0
China	1	.0
Croatia	2	.1
Denmark	6	.3
Ecuador	1	.0
Finland	3	.1
France	5	.2
France, Metropolitan	1	.0
Germany	16	.7
Greece	1	.0
India	5	.2
Ireland	5	.2
Israel	6	.3
Italy	8	.3
Japan	4	.2
Lithuania	1	.0
Luxembourg	2	.1

Country	Number of Respondents	Percent of Respondents
Kazakhstan	1	.0
Malaysia	1	.0
Mexico	3	.1
Netherlands	6	.4
New Zealand	8	.3
Nicaragua	1	.0
Norway	10	.4
Philippines	1	.0
Poland	1	.0
Portugal	1	.0
Romania	1	.0
Russia	7	.3
Saudi Arabia	2	.1
South Africa	2	.1
Spain	1	.0
Sri Lanka	1	.0
Sweden	19	.8
Switzerland	9	.4
United Kingdom	45	1.9
United States	1,888	81.6
U.S. Outlying Islands	1	.0
Vietnam	1	.0
Yugoslavia	1	.0
Other	2	.1
Missing Country	10	.4
Total	2,314	100.0

For many individual countries, there were too few respondents to allow for meaningful analyses of compensation levels and practices. Many analyses are restricted to the U.S. sample. Combining pay levels from different areas of the world would not provide useful information because pay levels and standards of living differ considerably in different countries and regions.

Benefit laws and practices also vary considerably in different countries. The items on the 1999 survey were based on laws and practices typical in the U.S. We anticipate that in surveys in future years, increasing numbers of respondents from countries other than the U.S. will allow SAGE to provide more information for those not in the U.S.

One should interpret salary, total cash, and bonus values to be in U.S. dollars. Most individuals appear to have converted to U.S. dollars, although a few respondents commented that they were reporting in another currency. For these individuals, values were converted into U.S. dollars. However, this problem makes it more difficult to interpret responses for those responding from outside the U.S. Unfortunately, survey instructions regarding currency to use were ambiguous. We apologize for this ambiguity. Instructions regarding currency will be improved on future surveys.

1999 Salary by Country or World Region

Country/ Region	Number of Respondents	Mean Salary	10th Percentile	25th Percentile	Median (50th Percentile)	75th Percentile	90th Percentile
United States	1,618	$64,271	$42,000	$50,000	$62,500	$75,000	$89,858
Canada	102	$53,587	$35,000	$43,000	$54,500	$64,125	$75,000
Australia & New Zealand	83	$52,181	$34,773	$40,000	$50,000	$60,000	$75,000
United Kingdom (incl. Ireland)	35	$52,809	$30,000	$37,500	$45,000	$45,000	$80,000
Western Europe	42	$51,841	$19,440	$33,126	$50,000	$65,000	$78,000
Northern Europe	30	$50,120	$28,500	$31,750	$42,050	$58,000	$68,000
Eastern Europe & Western Asia	14	$8,364	$850	$1,475	$4,600	$9,600	$32,500

The median is the 50th percentile; 10% of the sample have a value equal to or less than the 10th percentile; 25% of the sample have a value equal to or less than the 25th percentile value, and so forth.

Northern Europe: Denmark, Finland, Norway, and Sweden.
Western Europe: Andorra, Austria, Belgium, Cape Verde, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, and Spain.
Eastern Europe/Western Asia: Afghanistan, Albania, Croatia, Kazakhstan, Lithuania, Poland, Romania, Russia, and Yugoslavia.
Note: Because of the small sample sizes for areas outside the U.S., one should not consider figures for those areas to be representative.

The maximum salary reported in the survey was $365,000 and the maximum total cash reported was $1,400,000. Compensation from stock options as high as $600,000 was reported. These figures were from different respondents in the U.S. In the U.S., 1% of the sample reported salaries of $123,260 or more and total cash of $160,000 or more (i.e., these were the 99th percentile values).

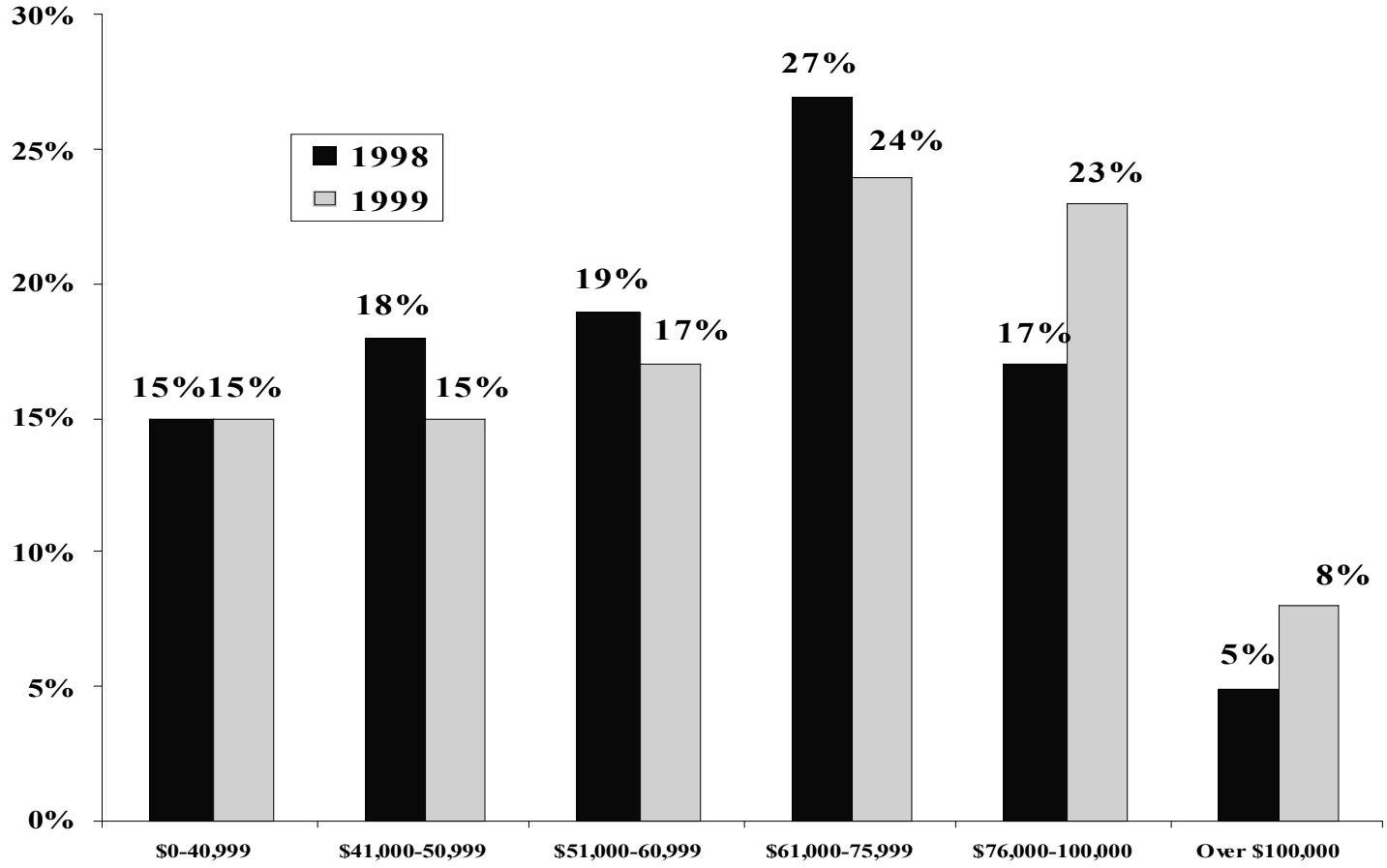
Total Cash in 1999 by Country or World Region							
Country/ Region	Number of Respondents	Mean Total Cash	10th Percentile	25th Percentile	Median (50th Percentile)	75th Percentile	90th Percentile
United States	1,587	$70,565	$42,000	$52,000	$65,200	$82,000	$100,000
Canada	100	$64,896	$30,000	$45,000	$57,250	$71,500	$89,500
Australia & New Zealand	83	$53,283	$30,393	$40,000	$51,000	$65,000	$85,000
United Kingdom (incl. Ireland)	35	$59,376	$30,000	$40,800	$50,000	$61,066	$95,000
Western Europe	41	$54,628	$15,600	$24,250	$55,000	$65,000	$107,000
Northern Europe	30	$53,760	$16,000	$30,500	$50,000	$64,500	$85,000
Eastern Europe & Western Asia	14	$9,215	$1,700	$3,000	$5,000	$10,300	$34,240

Total cash is salary, wages, bonuses, incentives, and other cash payments from all employers or clients, not including deferred payments, such as those paid into retirement accounts by an employer that one would not ordinarily be able to access now.

1999 Bonus by Country or World Region					
Country/ Region	Number of Respondents	Mean Bonus	% Not Reporting A Bonus	75th Percentile	90th Percentile
United States	1,644	$3,464	52.9%	$3,500	$10,000
Canada	102	$2,497	64.7%	$2,000	$4,940
Australia & New Zealand	85	$1,145	75.3%	$100	$5,000
United Kingdom (incl. Ireland)	35	$3,464	60.0%	$2,000	$4,000
Western Europe	43	$2,215	60.5%	$2,000	$6,800
Northern Europe	30	$1,623	60.0%	$2,125	$6,080
Eastern Europe & Western Asia	14	$250	64.3%	$525	$1,150

Comparison of Total Cash from 1999 and Annual Income from 1998 Surveys

The 1998 analysis of "annual income" was based on both U.S. and non-U.S. responses; the 1999 analysis of "total cash compensation" is also based on both U.S. and non-U.S. responses. The bar graph shows the percentage of the respondents for each of the two years who had income in the ranges shown at the bottom of the graph. The percentage with salary less than $41,000 was the same in 1999 (15%) as in 1998 (15%) because the sample included a higher proportion of respondents from outside the U.S. (29.0% in 1999 compared with 14.4% in 1998) where salaries are lower, on average. Percentages in the middle salary ranges decreased, while the percentage making $76,000 or more increased in 1999 (31%) compared to 1998 (22%), which demonstrates the trend of increasing salaries for system administrators.



Certain cities in the U.S. typically have higher compensation levels or have higher concentrations of system administrators than other areas of the U.S. Salaries and total cash were highest in the San Francisco, New York City, and Los Angeles areas. The mean bonus was significantly higher in Manhattan and Austin than in other cities

1999 Salary by Selected U.S. City

City	Number of Respondents	Mean Salary in U.S. Dollars
Manhattan, NY	23	$77,661
Other NY Metro Area	47	$68,341
San Francisco/San Jose Jose/Silicon Valley, CA Area	208	$77,920
Los Angeles/Orange Co., CA Metro Area	57	$68,635
Washington, DC Metro Area	99	$66,769
Boston, MA Metro Area	128	$64,122
Philadelphia, PA Metro Area	24	$63,548
San Diego, CA Metro Area	27	$68,559
Research Triangle, NC	23	$61,638
Austin, TX Metro Area	43	$61,679
Office is in U.S., But Not in One of Above Areas	939	$60,286
All U.S. Locations	1,618	$64,271

Total Cash in 1999 by Selected U.S. City

City	Number of Respondents	Mean Salary in U.S. Dollars
Manhattan, NY	22	$84,614
Other NY Metro Area	48	$74,757
San Francisco/San Jose Jose/Silicon Valley, CA Area	200	$97,590
Los Angeles/Orange Co., CA Metro Area	54	$73,243
Washington, DC Metro Area	99	$70,047
Boston, MA Metro Area	120	$71,685
Philadelphia, PA Metro Area	23	$66,935
San Diego, CA Metro Area	28	$69,021
Research Triangle, NC	23	$69,296
Austin, TX Metro Area	41	$66,512
Office is in U.S., But Not in One of Above Areas	929	$64,299
All U.S. Locations	1,587	$70,565

1999 Bonus by Selected U.S. City

City	Number of Respondents	Mean Salary in U.S. Dollars
Manhattan, NY	23	$6,843
Other NY Metro Area	50	$3,256
San Francisco/San Jose Jose/Silicon Valley, CA Area	210	$3,879
Los Angeles/Orange Co., CA Metro Area	57	$2,248
Washington, DC Metro Area	102	$2,754
Boston, MA Metro Area	130	$3,004
Philadelphia, PA Metro Area	24	$1,115
San Diego, CA Metro Area	28	$3,268
Research Triangle, NC	23	$4,002
Austin, TX Metro Area	43	$8,541
Office is in U.S., But Not in One of Above Areas	954	$3,336
All U.S. Locations	1,644	$3,464

Salary by Zip Code Area

U.S. zip codes also provide a way to analyze 1999 salary levels by geographical area. Some zip codes had few respondents and had to be combined with other adjacent zip code areas. A few zip codes had no respondents. The state(s) in which the zip codes are used are shown in parentheses. Mean salaries over $75,000 were reported in two New York (10 and 11), one North Carolina (28), and two California (Sacramento and San Francisco area) zip code areas (94 and 95). These were the zip codes with the highest mean salaries.

First 2 Digits U.S. Zip Code	Number of Respondents	Mean 1999 Salary
01 (MA)	56	$64,601
02 (MA & RI)	78	$62,228
03 & 05 (NH, VT & ME)	10	$65,940
04 (ME)	6	$47,283
06 (CT)	11	$68,909
07 (NJ)	31	$74,810
08 & 09 (NJ & NY)	16	$69,806
10 (NY)	28	$76,464
11 (NY)	5	$75,400
12 (NY)	10	$53,974
13 (NY)	4	$49,000
14 (NY)	13	$63,981
15 (PA)	13	$52,099
16 (PA)	7	$46,786
17 & 18 (PA)	5	$57,800
19 (PA & DE)	22	$60,841
20 (DC, MD & VA)	67	$67,510
21 (MD)	22	$63,112
22 (VA)	25	$58,793
23 (VA)	15	$54,735
24 & 25 (VA & WV)	5	$50,400
27 (NC)	27	$61,034
28 (NC)	5	$78,064
29 (SC)	10	$45,735
30 (GA)	29	$63,916
32 (FL)	17	$51,453

First 2 Digits U.S. Zip Code	Number of Respondents	Mean 1999 Salary
33 (FL)	21	$55,323
34 & 35 (FL & AL)	5	$69,000
36 (AL)	5	$60,872
37 (TN)	10	$57,547
38 & 39 (TN & MS)	7	$55,020
40 & 41 (KY)	6	$45,233
43 (OH)	20	$71,575
44 (OH)	7	$51,929
45 (OH)	12	$62,450
46 (IN)	10	$49,920
47 (IN)	8	$52,156
48 (MI)	33	$62,052
49 & 50 (MI & IA)	13	$56,093
52 (IA)	4	$50,975
53 (WI)	28	$50,743
54 (WI)	5	$43,509
55 (MN)	52	$61,341
56, 57, 58, 59 (MN, MT, ND & SD)	6	$39,167
60 (IL)	53	$67,160
61 & 62 (IL)	13	$47,038
63, 64, 65 (MO)	12	$57,525
66 & 67 (KS)	13	$50,661
68 & 69 (NE)	9	$56,656
70 (LA)	7	$63,929
71 & 72 (LA & AR)	5	$49,500

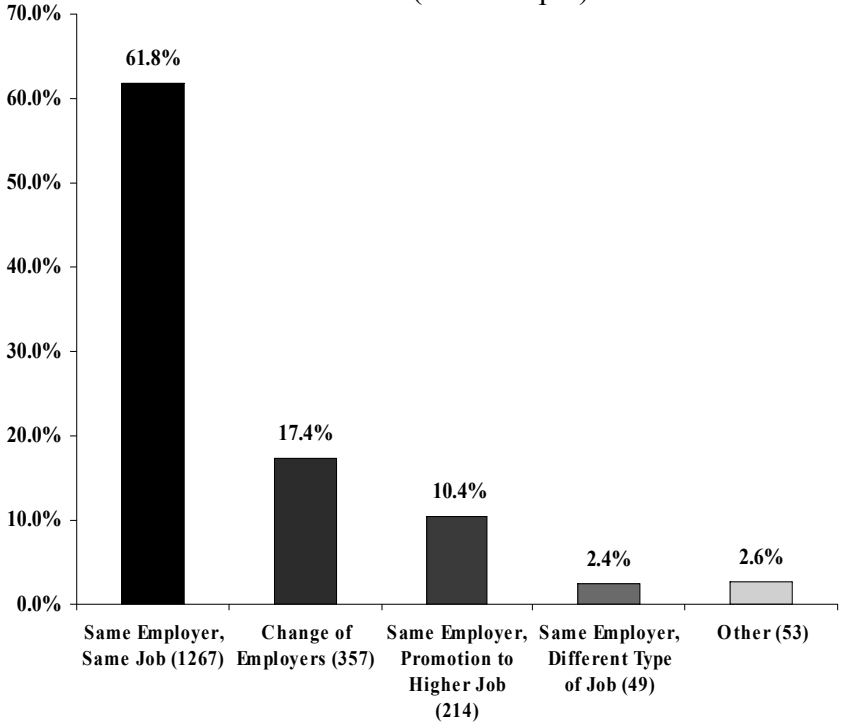
First 2 Digits U.S. Zip Code	Number of Respondents	Mean 1999 Salary
73 & 74 (OK)	5	$50,300
75 (TX)	46	$65,769
76 (TX)	10	$63,905
77 (TX)	28	$56,945
78 & 79 (TX)	46	$59,957
80 (CO)	77	$64,920
81 & 82 (CO & WY)	3	$49,067
83 (ID)	7	$56,814
84 (UT)	16	$59,272
85 & 86 (AZ)	30	$65,864
87 & 88 (NM & NV)	21	$67,397
89 (NV)	4	$59,563
90 (CA)	27	$69,324
91 (CA)	22	$69,227
92 (CA)	40	$65,831
93 (CA)	8	$54,125
94 (CA)	148	$76,554
95 (CA)	79	$76,428
96 (CA, HI & Guam)	4	$52,900
97 (OR)	26	$51,532
98 (WA)	84	$62,648
99 (WA & AK)	16	$54,325

SIZES AND TYPES OF PAY INCREASES AND BONUSES

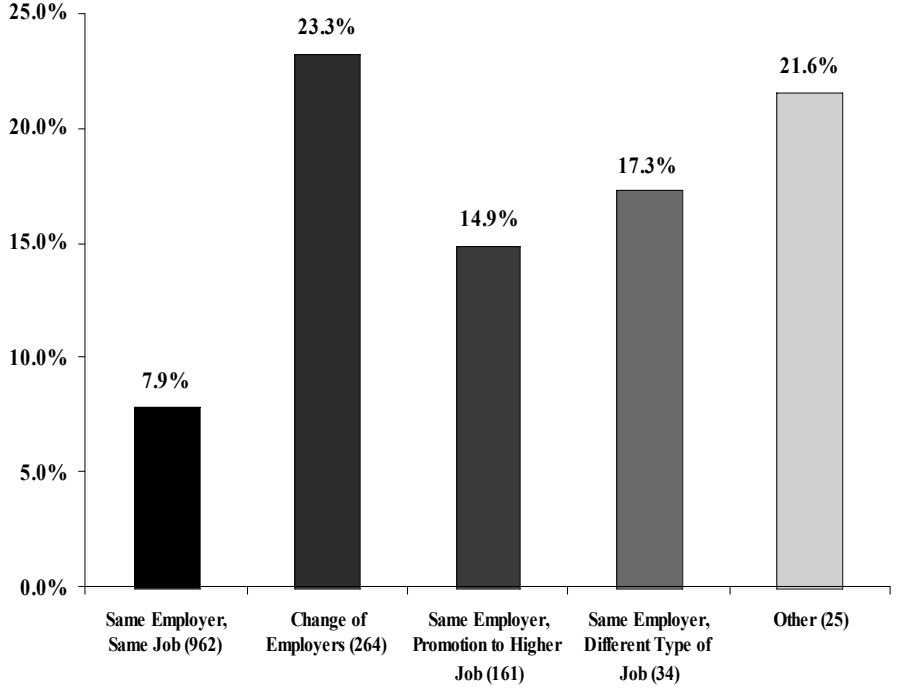
Sizes and Types of Pay Increases

As of the date when respondents answered the survey, during the 4th quarter of 1999, 1,764 (85.7% of the system administrator respondents) indicated that they had received a 1999 pay increase. Eight respondents indicated they had received a 2000 pay increase and, 191 (9.3%) indicated that their most recent pay increase, as of the date they answered the survey, had been in 1998. Most increases (61.8%) had been from the same employer for the same job as currently held. This is based on the total sample. For those in the U.S., the average 1999 pay increase from the same employer for the same job was 7.9%, from the same employer for a promotion 14.9%, and from changing employers 23.3%. The averages were 8.3%, 15.1%, and 23.4%, respectively, for the total sample.

Percentage with Type of Increase
(total sample)



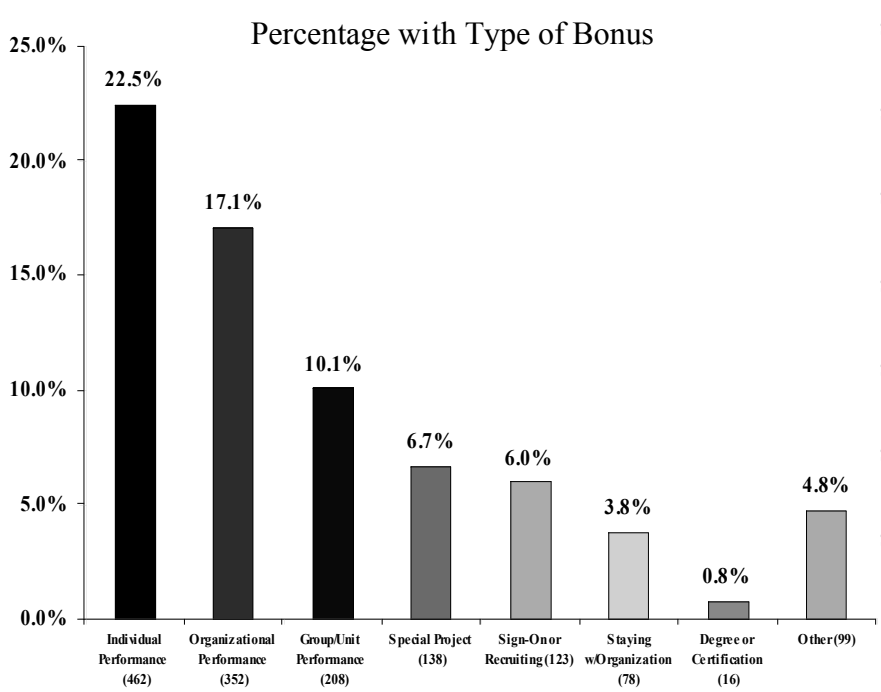
Increase Size as a Percentage of Salary
(U.S. system administrators)

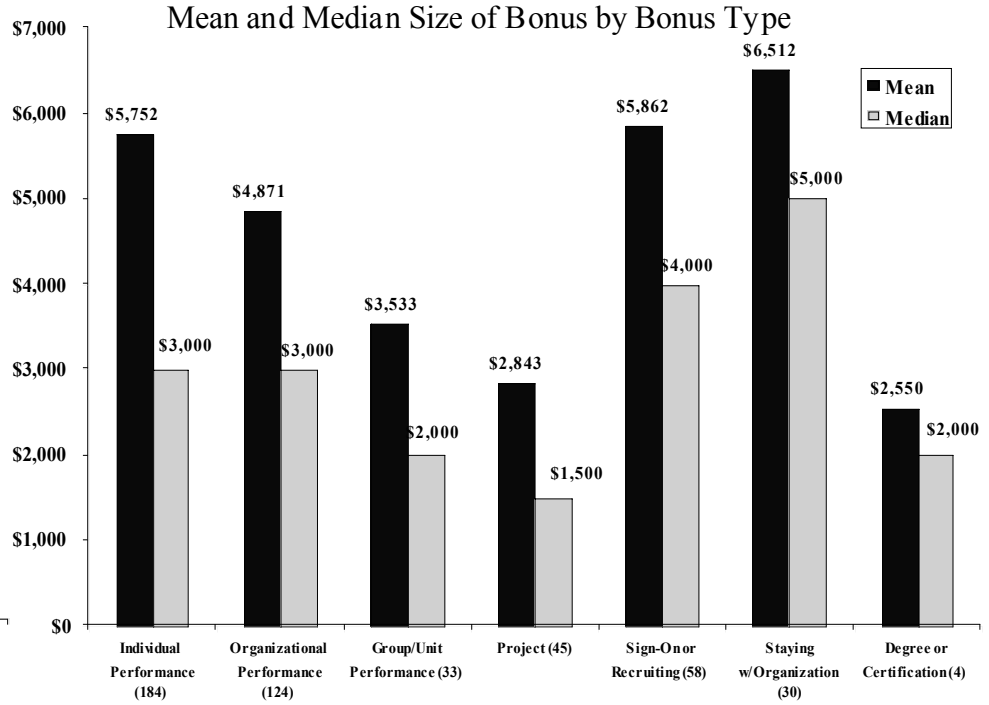


Number of respondents per category is in parentheses after category label on bottom axis.

Sizes and Types of Bonuses

Over half (52.1%) of system administrator respondents in the total sample did not receive a bonus in the twelve months prior to the survey. The following chart shows percentages of respondents who received various types of bonuses. Of those in the "other" category, 21, or 1.0% of system administrators, had reported bonuses in the form of profit sharing or stock/stock options. Because the item on type of bonus did not provide a category for stock and options, this may underrepresent the number who received this type of compensation. Of 1,690 system administrator respondents from the U.S., 788 (46.6%) received some type of bonus. To determine what the typical size of a bonus was by the type of bonus, we could only use data from those who had reported a single type of bonus - 537 (68.1%) of those who reported a bonus, reported only one type of bonus. Based on these 537 bonuses, bonus size varied considerably by type. Mean bonus is in the taller bar and median bonus is in the shorter bar in each pair of bars on the chart on the right. The mean stock option reported was $76,500, and the median was $27,000. Mean bonus size for other areas of the world and locations within the U.S. are shown in the section of the report on countries, cities, regions, and zip/postal codes.





Number of respondents per category is in parentheses after category label on bottom axis.

OVERTIME, SHIFT, ON-CALL PAY, AND TRAVEL

For U.S. system administrator respondents, 15.4% reported receiving overtime pay, 10.1% shift pay, and 15.9% on-call/pager pay. Based on responses, overtime pay for U.S. system administrators is most prevalent in aerospace, government, and the military. Shift pay is most prevalent in the aerospace industry and federal government (non-military). Over one-quarter of U.S. respondents in health care, state/local government, and transportation organizations said they get paid for being on call or wearing a pager.

Percentage of Respondents who Receive Overtime, Shift, and On-Call Pay by Industry
(U.S. system administrators)

Industry	Overtime Pay	Shift Pay	On-Call/Pager Pay
Advertising, Public Relations, Communication, or Marketing	8.3%	8.3%	11.1%
Aerospace	55.1%	30.6%	6.1%
Agriculture, Environmental Services, Mining, or Energy Production	14.3%	0.0%	14.3%
Biotechnology	8.3%	8.3%	12.5%
Consulting and Business Services	21.2%	8.2%	16.3%
Computer, Software, and/or Internet	10.5%	10.2%	20.2%
Education - College or University	5.8%	2.2%	4.7%
Engineering	16.3%	12.2%	20.4%
Entertainment	12.5%	0.0%	12.5%
Federal Government, Nonmilitary	37.9%	24.1%	17.2%
Finance, Insurance, and Real Estate	11.8%	15.1%	15.1%
Health Care/Medicine	4.3%	14.9%	31.9%
Manufacturing	21.6%	10.8%	18.6%
Military	47.8%	17.4%	4.3%
Not-for-Profit	14.3%	14.3%	21.4%
Pharmaceuticals	22.2%	0.0%	22.2%
Publishing	13.6%	4.5%	9.1%
Research	13.8%	3.4%	10.3%
Retail and Wholesale Trade	5.9%	0.0%	14.7%
State or Local Government	39.1%	13.0%	26.1%
Transportation	15.4%	0.0%	30.8%
Utility	18.4%	18.4%	15.8%

For all system administrators who responded, 52.4% did not spend any days on out-of-town work-related travel. The average system administrator spent 11.3 days in out-of-town work-related travel. The number of days of travel had no significant relationship to levels of salary, total cash, or bonus for U.S. system administrators.

RELATIONSHIPS BETWEEN JOB CHARACTERISTICS AND COMPENSATION

Type of Primary Job
(total sample of system administrators)

Job Type	Number of Respondents	Percent of Respondents
Salaried	2,077	90.1%
Contractor	183	8.0%
Independent, self-employed consultant	48	1.9%

1999 Salary by Type of Primary Job
(U.S. system administrators)

Job Type	Number of Respondents	Mean Salary in U.S. Dollars
Salaried	1,498	$62,152
Contractor	139	$77,307
Independent, self-employed consultant	24	$96,121

Total Cash in 1999 by Type of Primary Job
(U.S. system administrators)

Job Type	Number of Respondents	Mean Total Cash in U.S. Dollars
Salaried	1,470	$68,742
Contractor	135	$78,346
Independent, self-employed consultant	24	$106,746

1999 Bonus by Type of Primary Job
(U.S. system administrators)

Job Type	Number of Respondents	Mean Bonus in U.S. Dollars
Salaried	1,524	$3,433
Contractor	142	$2,477
Independent, self-employed consultant	24	$7,750

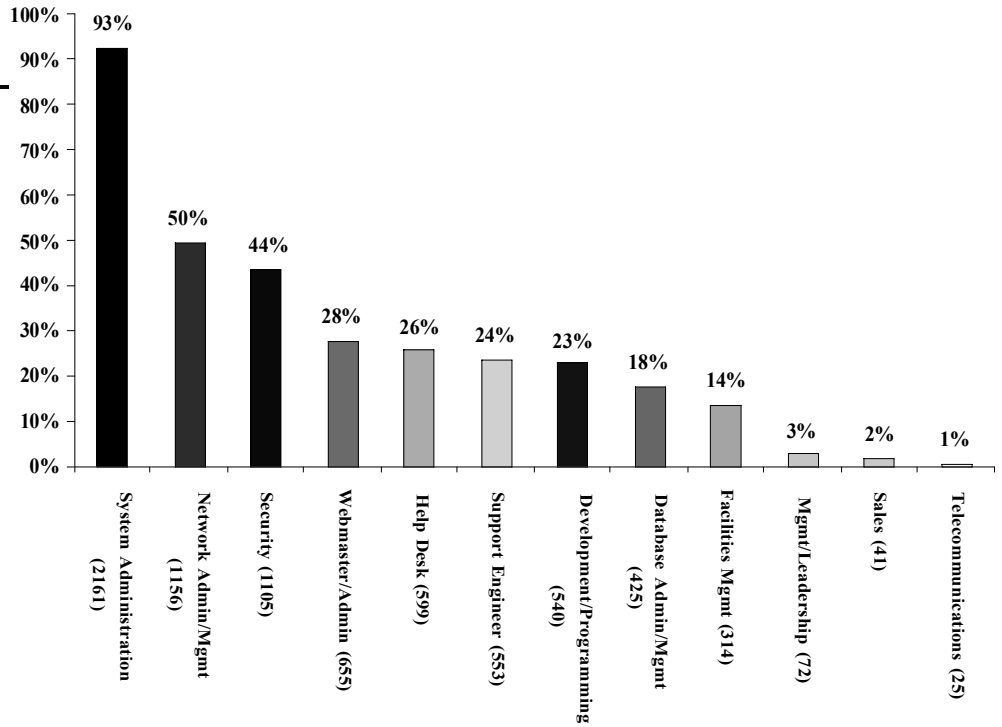
Note: Differences in salary, total cash, and bonus for salaried, contractor, and independent consulting job types are significantly different.

How would you characterize your major job responsibilities?

Respondents could use more than one category to characterize their major job responsibilities and many combinations of the 10 categories were possible. The average respondent marked 3.3 categories. Pay levels for some of the most common combinations of responsibilities are presented here. The only clear pattern that emerges is that salaries for those who do not include system administration among their job responsibilities are often higher. For example, some specialists (i.e., those who marked security only, support engineer only, or programmer only from the choices for major job responsibilities) had mean pay above $70,000.

Salary by Major Job Responsibilities
(U.S. system administrators)

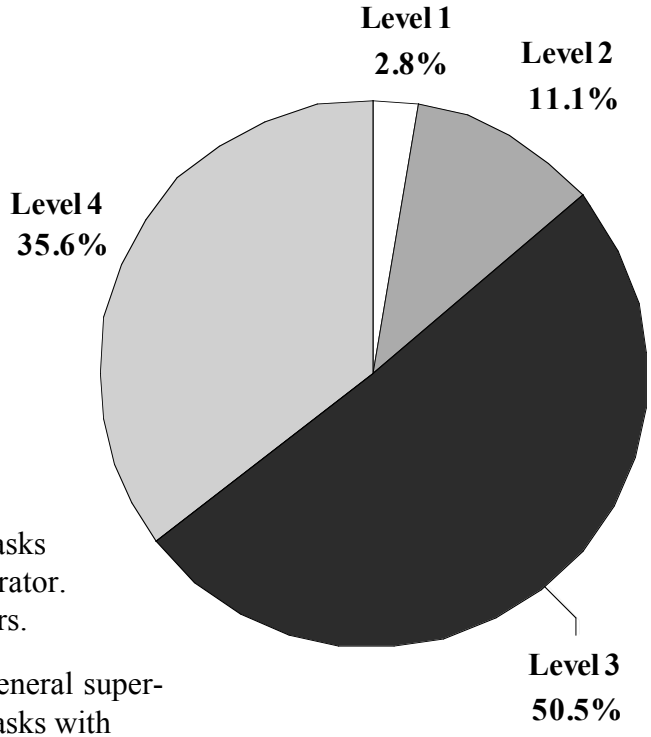
Major Job Responsibilities	Number of Respondents	Mean Salary	Mean Total Cash	Mean Bonus
System Administration Only	484	$63,233	$70,838	$3,888
System & Network Administration Only	93	$62,701	$67,614	$2,986
System & Network Administration and Security	81	$71,673	$78,698	$6,479
System Administration, Security, and Web Administration	66	$64,657	$72,230	$4,606
System & Network Administration, Security, and Web Administration	39	$69,176	$74,153	$4,227
Network Administration Only	30	$64,598	$69,878	$3,182
System Administration and Support Engineer	26	$65,059	$68,404	$2,269
System Administration and Help Desk	26	$67,181	$75,219	$2,319
System & Network Administration, Security, and Help Desk	24	$55,554	$55,290	$313
Security Only	15	$72,118	$80,977	$2,891
Support Engineer Only	14	$73,014	$78,764	$5,532
Programmer Only	11	$71,841	$77,387	$2,641



Which statement best describes your responsibilities on your primary job?

SAGE Job Description Level for Primary Job
(total sample of system administrators)

Level	Number of Respondents	Percent of Respondents
Level 1	57	2.8%
Level 2	233	11.3%
Level 3	1,054	51.2%
Level 4	713	34.7%



Level 1 — Assist in the administration of a systems facility. Perform routine tasks under the direct supervision of a more experienced system administrator. Act as a front-line interface to users and senior system administrators.

Level 2 — Assist in the administration of a systems facility. Work under the general supervision of a computer system manager, carrying out more complex tasks with some independence and discretion regarding how to carry out the tasks.

Level 3 — Receive general instructions for assignments from supervisor, and work with independence and discretion regarding how to carry out tasks. Initiate some new responsibilities and help to plan for the future of the facility. Manage the work of novice system administrators or operators. Evaluate and/or recommend purchases and have a strong influence on the purchasing process.

Level 4 — Design and manage the computing infrastructure. Work under general direction from senior management. Establish or recommend policies on system use and services. Provide technical lead and/or supervise system administrators, system programmers, or others of equivalent seniority. Have purchasing authority and responsibility for purchase decisions and budget.

Relationship between SAGE Job Description Level and Compensation
(for respondents whose primary line of work is system administration)

1999 Salary by SAGE Job Description Level
(U.S. system administrators)

Job Level	Number of Respondents	Mean Salary in U.S. Dollars
Level 1	46	$47,847
Level 2	190	$54,765
Level 3	864	$61,703
Level 4	561	$71,725
Mean for All Levels	1,661	$63,911

1999 Bonus by SAGE Job Description Level
(U.S. system administrators)

Job Level	Number of Respondents	Mean Bonus in U.S. Dollars
Level 1	47	$1,519
Level 2	193	$1,540
Level 3	875	$3,414
Level 4	575	$4,197
Mean for All Levels	1,690	$3,414

Total Cash in 1999 by SAGE Job Description Level
(U.S. system administrators)

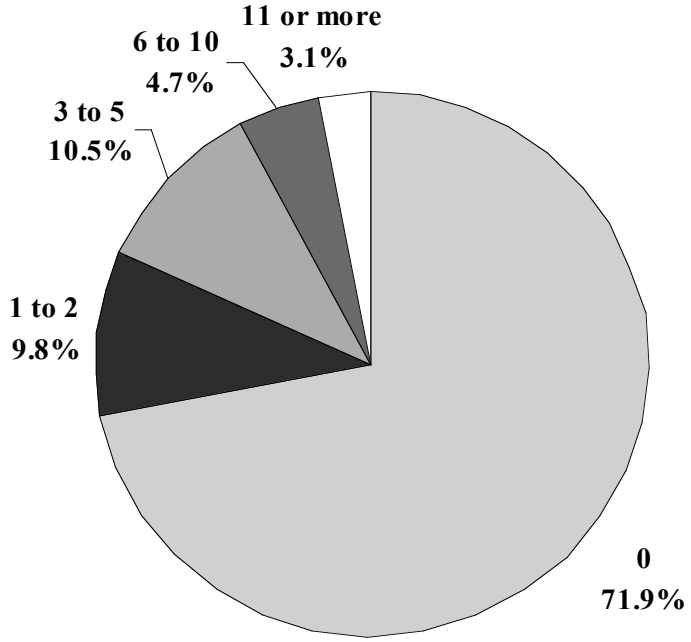
Job Level	Number of Respondents	Mean Total Cash in U.S. Dollars
Level 1	43	$50,766
Level 2	181	$57,806
Level 3	851	$66,578
Level 4	554	$81,021
Mean for All Levels	1,629	$70,098

Note: Salary, total cash, and bonuses are significantly different for the different job description levels.

For how many employees do you have direct, formal supervisory or management responsibility?

Number of Subordinates
(total sample of system administrators)

Response	Number of Respondents	Percent of Respondents
0	1,460	72.0%
1 to 2	198	9.8%
3 to 5	212	10.5%
6 to 10	95	4.7%
11 or more	62	3.1%



1999 Salary by Number of Subordinates
(U.S. system administrators)

Number of Subordinates	Number of Respondents	Mean Salary in U.S. Dollars
0	1,204	$62,448
1 to 2	156	$63,297
3 to 5	157	$67,779
6 to 10	73	$70,044
11 or more	51	$78,168

The mean number of subordinates was 5.4. This includes a respondent with 6,000 subordinates. Without this high value, the mean is 2.4 subordinates per respondent. The majority (72.0%) of system administrators had no subordinates.

The relationship between the number of subordinates supervised and the respondent's salary level is statistically significant, though not as strong as for some other factors affecting compensation. Number of subordinates was not significantly related to total cash in 1999 or the size of 1999 bonus

Hours Worked Per Week on Primary Job

The majority of system administrator respondents worked full-time (35 hours or more per week) on their primary job. They averaged 47.0 hours per week. For U.S. system administrators, compensation tended to go up with hours worked up to 60 hours. The bottom left table shows hours per week on the primary job by total cash for those who had only one employer. The bottom right table shows hours on the primary job by total cash for those with more than one employer. We did not ask hours per week worked on all jobs. Mean total cash is higher in each category for those with more than one employer, as one might expect. Compensation is significantly lower for those who work part time.

1999 Salary on Primary Job by Hours per Week on Primary Job (U.S. system administrators)

Hours	Number of Respondents	Mean Salary in U.S. Dollars
0-19	7	$41,848
20-34	22	$54,449
35-40	374	$62,845
41-45	457	$62,900
46-50	460	$65,613
51-60	268	$66,156
61 or more	59	$64,900

1999 Bonus on Primary Job by Hours per Week (U.S. system administrators)

Hours	Number of Respondents	Mean Bonus in U.S. Dollars
0-19	10	$3,850
20-34	22	$680
35-40	377	$2,273
41-45	464	$3,034
46-50	468	$3,217
51-60	276	$5,935
61 or more	59	$4,203

Total Cash on All Jobs in 1999 by Hours per Week on Primary Job (U.S. system administrators with one employer)

Hours	Number of Respondents	Mean Total Cash in U.S. Dollars
0-19	6	$37,633
20-34	18	$53,935
35-40	333	$64,130
41-45	417	$65,483
46-50	421	$76,955
51-60	238	$73,412
61 or more	52	$71,743

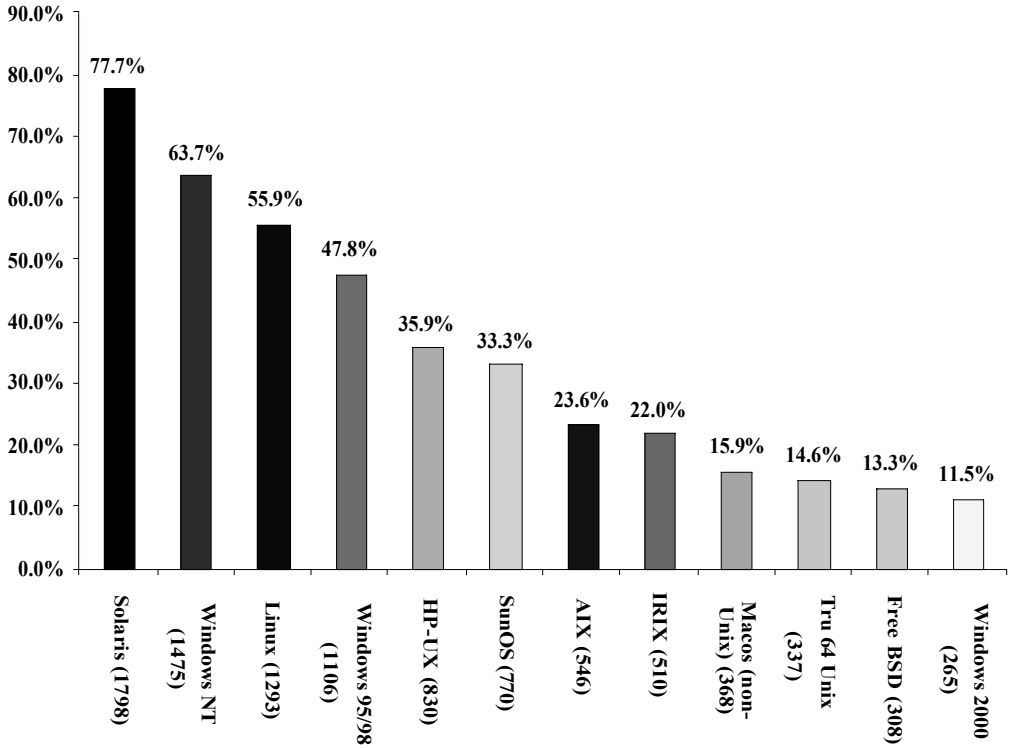
Total Cash on All Jobs in 1999 by Hours per Week on Primary Job (U.S. system administrators with more than one employer)

Hours	Number of Respondents	Mean Total Cash in U.S. Dollars
0-19	2	$63,500
20-34	3	$71,000
35-40	28	$78,339
41-45	37	$74,752
46-50	28	$76,786
51-60	27	$79,185
61 or more	5	$77,400

Operating Systems

On average, respondents indicated that they worked with or supported 4.7 operating systems on their primary job. Over half the sample worked with Solaris, Windows NT, and/or Linux. The bar graph on the left shows those supported by 10% or more of the respondents.

The number of operating systems at a facility was not significantly related to respondents' salary, total cash, or bonus levels. Types of operating systems respondents supported were more strongly related to salary levels than to levels of total cash or bonuses. Regression analyses in which all types of operating systems mentioned on the survey were included simultaneously indicated that certain operating systems were significantly related to differences in salary and total cash for U.S. system administrators. (See the lists on the right. Operating systems which were not significantly related to salary or total cash are not shown.)



Operating System	Positive or Negative Relationship to Salary
Solaris	+ $3,047
BSDI	+ $2,550
HP-UX	+ $2,517
Free BSD	- $1,796
Macos (non-Unix)	- $1,914
Open BSD	- $2,696
DOS/Win 3.1	- $3,670

Operating System	Positive or Negative Relationship to Total Cash
BSDI	+ $9,846
Solaris	+ $4,962
Windows NT	- $3,213

Number of respondents per category is in parentheses after category label on bottom axis. Results are based on both U.S. and non-U.S. respondents in the bar graph; only U.S. respondents were used in the regression equations with salary and total cash.

RELATIONSHIPS BETWEEN PERSONAL BACKGROUND AND COMPENSATION

What is your highest level of education?

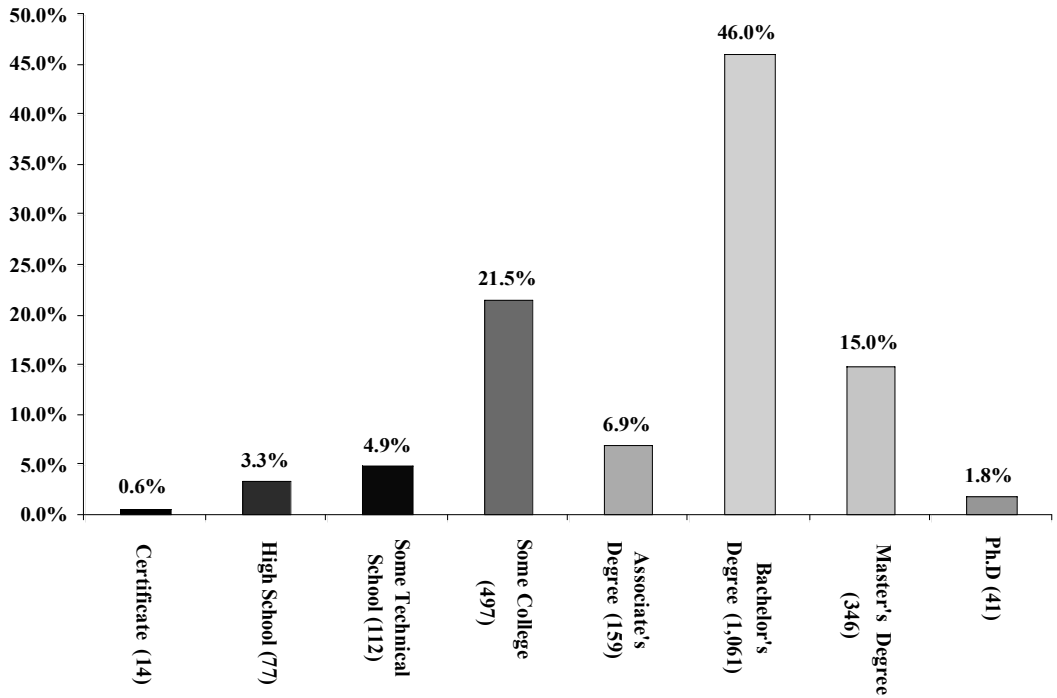
The most common education level for respondents was a bachelor's degree or some college. More than half (58.2%) said their education or degree was computer related, while 41.8% indicated it was not. Whether one's education was computer related was not significantly related to the level of salary, total cash, or bonus for U.S. system administrators. Level of education was related to higher salaries and total cash, but not to higher bonuses. The relationship between education level and salary was stronger and more uniform than the relationship between education level and total cash.

1999 Salary by Level of Education
(U.S. system administrators)

Level of Education	Number of Respondents	Mean Salary in U.S. Dollars
Certificate	6	$46,050
High School	44	$58,055
Some Technical School	77	$60,533
Some College	383	$61,076
Associate's Degree	123	$61,585
Bachelor's Degree	770	$64,641
Master's Degree	237	$67,998
Ph.D.	20	$72,160

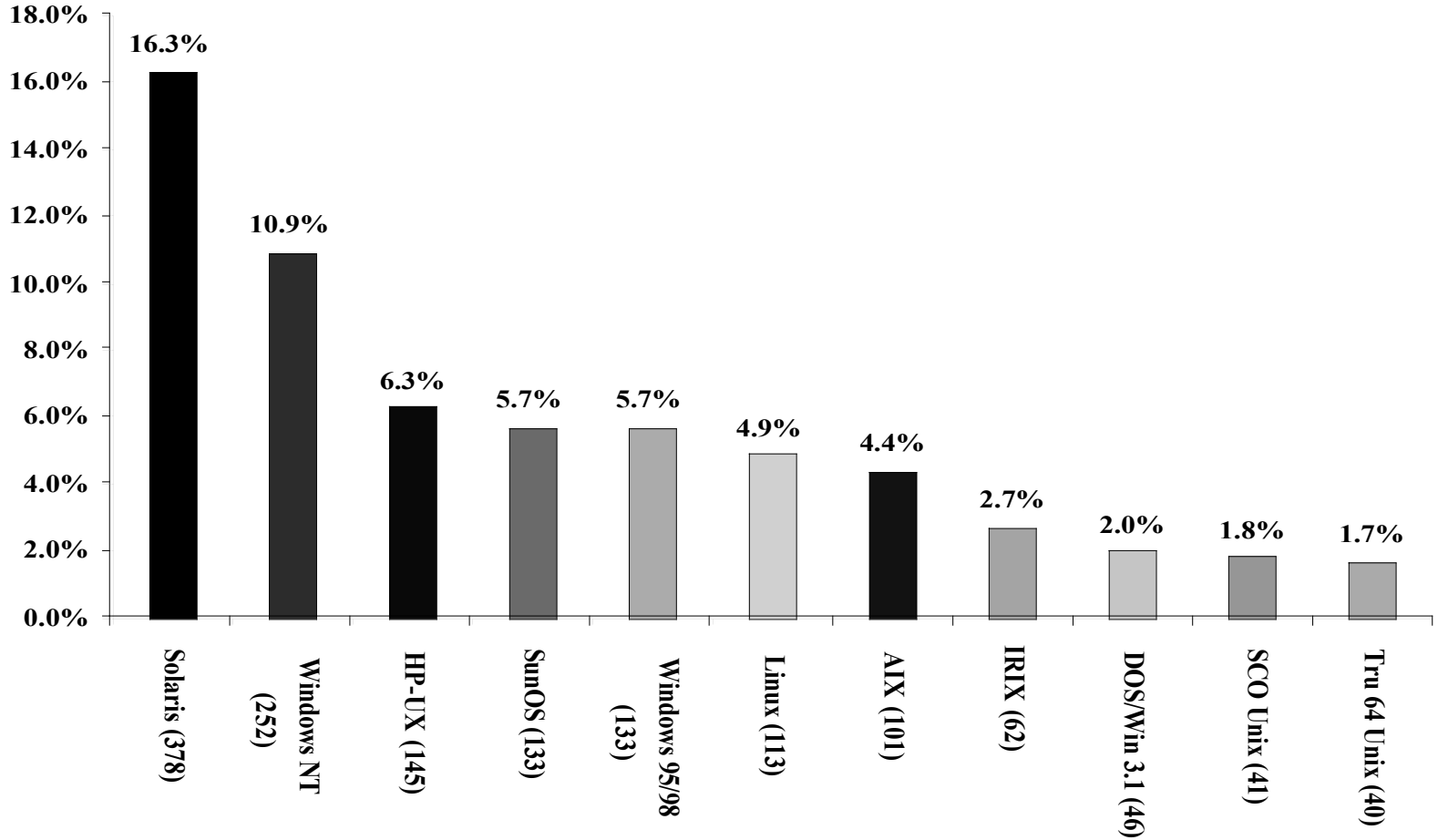
Total Cash in 1999 by Level of Education
(U.S. system administrators)

Level of Education	Number of Respondents	Mean Total Cash in U.S. Dollars
Certificate	8	$37,894
High School	43	$64,943
Some Technical School	75	$63,615
Some College	371	$67,690
Associate's Degree	120	$77,679
Bachelor's Degree	758	$70,257
Master's Degree	236	$71,814
Ph.D	17	$77,660



Certifications

For respondents in all countries, 65.4% indicated that they were not certified on any operating systems. For those who were certified, they had a mean of 2.1 certifications. The following certifications were those reported most frequently by respondents:



Number of respondents per category is in parentheses after category label on bottom axis.

In the U.S., the number of certifications respondents reported having was positively related to salary and total cash.

1999 Salary by Number of Certifications
(U.S. system administrators)

Number of Certifications	Number of Respondents	Mean Salary in U.S. Dollars
0	1,086	$62,992
1	313	$64,116
2	134	$66,981
3	44	$66,797
4	33	$67,591
5	20	$66,125
6 or more	31	$71,322

Total Cash in 1999 by Number of Certifications
(U.S. system administrators)

Number of Certifications	Number of Respondents	Mean Total Cash in U.S. Dollars
0	1,063	$68,603
1	304	$68,933
2	131	$70,099
3	45	$103,103
4	34	$72,276
5	20	$72,738
6 or more	32	$80,453

Note: The much higher mean on total cash for those with three certifications is caused by a respondent with an unusually high level of total cash, probably due to stock options.

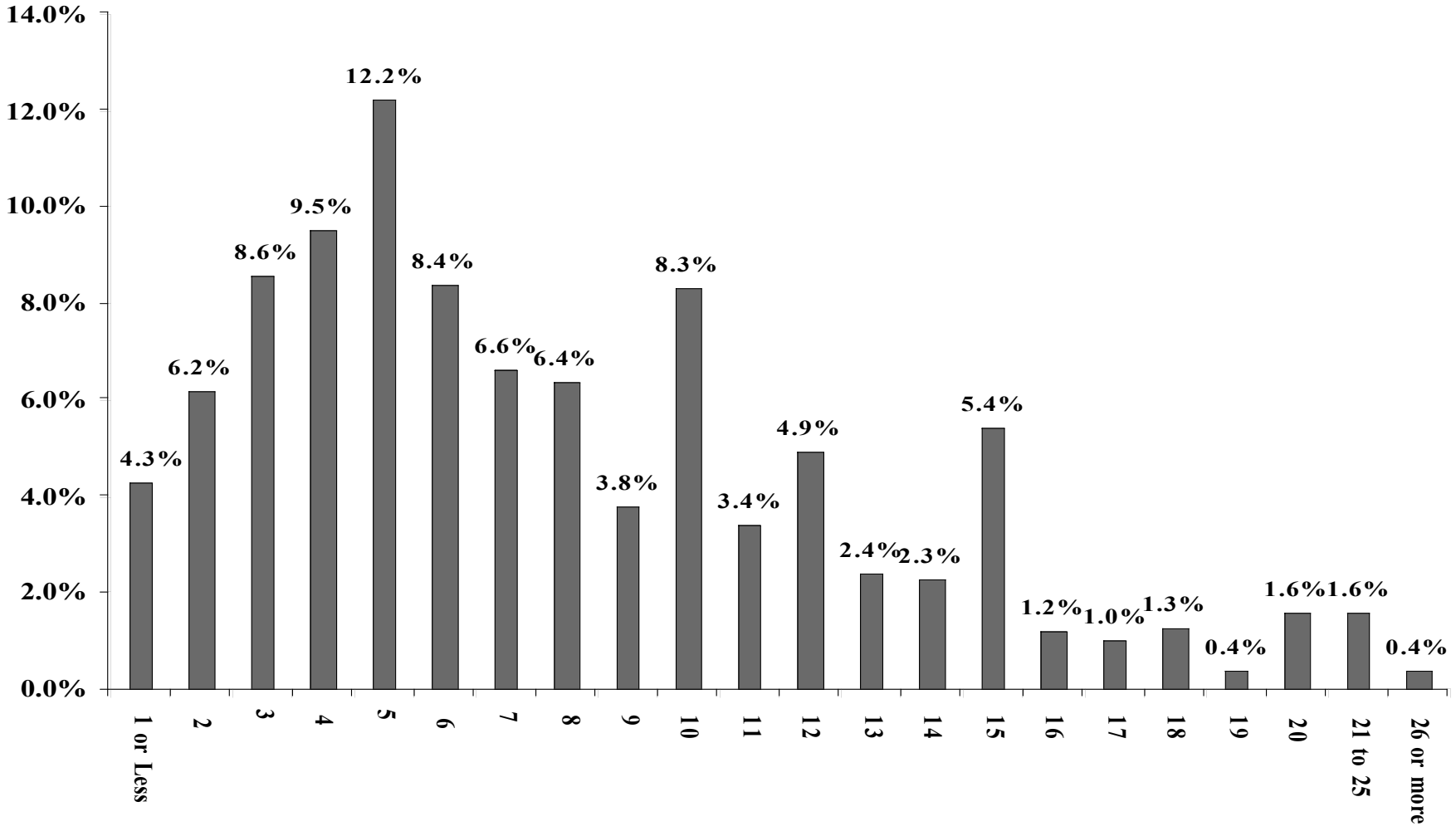
A regression analysis in which all types of certifications mentioned on the survey were included simultaneously indicated that certain certifications are significantly related to differences in salary levels and amount of total cash for U.S. system administrators. Compared to those with no certifications, the certifications listed below were related to the following additional amounts of salary and total cash compensation, on average. Other types of certification had no significant relationship with salary or total cash.

Certification	Positive or Negative Relationship to Salary
HP-UX	+ $2,778
Solaris	+ $2,749

Certification	Positive or Negative Relationship to Total Cash
SunOS	+ $9,946
HP-UX	+ $9,081
Solaris	+ $3,342

Years of Experience

The mean number of years reported for experience in system administration or highly similar work was 7.9. It ranged from less than 1 year to 31 years. These results are based on both U.S. and non-U.S. respondents. Spikes in percentages at 5, 10, and 15 years suggest that people often round their experience to the nearest 5-year increment when they report it.



Years of experience in system administration or very similar work had a stronger relationship with salary and total cash than either education level or certification. (Experience had a correlation of .40 with salary, so it accounted for 16% of the variation in salaries among the U.S. systems administration.)

Salary by Years of Experience
(U.S. system administrators)

Years of Experience	Number of Respondents	Mean Salary in U.S. Dollars
1 or less	58	$38,163
2	90	$46,178
3	138	$54,288
4	159	$55,508
5	204	$60,246
6	145	$63,643
7-8	224	$67,814
9-10	196	$67,510
11-12	142	$72,167
13-14	83	$74,749
15-16	109	$76,958
17-20	73	$76,934
21-25	29	$77,950
26 or more	8	$77,780

Total Cash in 1999 by Years of Experience
(U.S. system administrators)

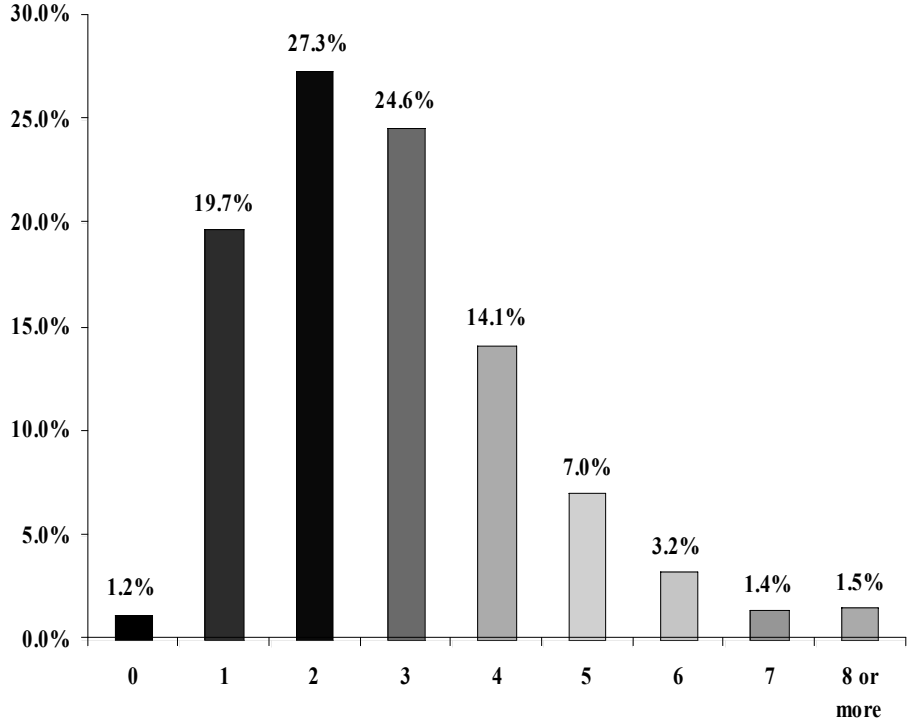
Years of Experience	Number of Respondents	Mean Total Cash in U.S. Dollars
1 or less	56	$38,209
2	85	$49,951
3	135	$57,523
4	155	$57,028
5	200	$65,144
6	145	$68,286
7-8	222	$72,005
9-10	191	$73,837
11-12	137	$84,211
13-14	82	$81,584
15-16	109	$82,773
17-20	75	$87,862
21-25	28	$128,800
26 or more	7	$81,820

The mean number of years respondents had worked for their current primary employer was 4.2 years. This ranged from less than 1 year to 36 years. Half of respondents had worked for their current employer 2 years or less. There was no clear or significant pattern of relationship between years with one's current employer and compensation levels.

Number of Employers During Career

The number of employers respondents have worked for as a system administrator or in highly similar work was 2.8, on average. For U.S. respondents, the number of employers respondents have had while working in system administration or very similar work was more highly related to compensation level than education or certifications, though not as highly related as years of experience. (It was correlated .32 with salary, so it accounted for 10% of the variation in salaries for U.S. respondents.) The relationship between the number of employers in one's career and salary could not be explained away by years of experience. Nor could it be explained away by the fact that consultants and contractors reported having had more employers, on average.

Given that the average number of years of experience was 7.9 and the average number of employers was 2.8, this suggests that respondents stayed with an employer an average of 2.8 years.



The bar graph is based on U.S. and non-U.S. respondents.

1999 Salary and Total Cash by Number of Employers
(U.S. system administrators)

Number of Employers	Number of Respondents	Mean Salary in U.S. Dollars	Mean Total Cash in U.S. Dollars
1	291	$55,338	$58,460
2	445	$58,925	$62,537
3	419	$65,002	$68,901
4	243	$70,397	$77,853
5	123	$74,876	$83,240
6	55	$71,836	$92,523
7	26	$78,595	$137,815
8 or more	26	$87,667	$108,536

Sex and Age

The majority of respondents in the total sample (87.3%) were male. For U.S. respondents who were system administrators, 86.6% were male. Salary and total cash compensation were significantly related to sex of respondents; bonuses were not. Differences in years of experience, hours worked, level of education, and other factors might account for some of the difference in pay levels. Regression analyses presented in the section titled "Factors with the Strongest Relationship to Compensation," near the end of this report, evaluates that possibility.

The mean age was 34 years. Age ranged from 17 to 75. Over three-fourths (75.7%) were in their 20s or 30s. Analysis using partial correlations indicates that the relationship between years of experience and level of compensation is stronger than the relationship between age and compensation level.

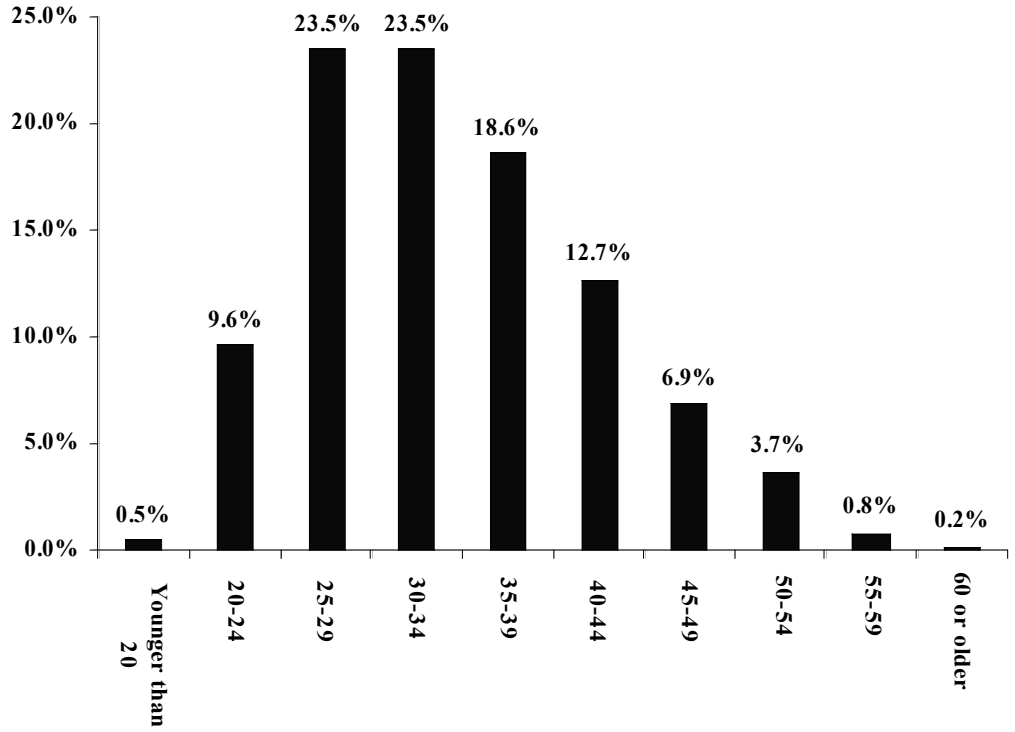
Sex of Respondents
(total sample)

Response	Number of Respondents	Percent of Respondents
Male	2,012	87.3%
Female	293	12.7%

1999 Salary and Total Cash by Sex
(U.S. system administrators)

Sex of Respondent	Number of Respondents	Mean Salary in U.S. Dollars	Mean Total Cash in U.S. Dollars
Male	1,435	$64,883	$71,214
Female	225	$57,777	$62,863

Percentage of Respondents in Age Groups
(total sample)



Membership in Professional Organizations and Working for More Than One Employer

Over half of respondents were members in USENIX/SAGE. Those who reported no membership in professional organizations had significantly lower salaries and total cash compensation. Those who were members in USENIX/SAGE and IEEE had significantly higher salaries and total cash compensation than other respondents, on average (see top tables).

The vast majority (90.9%) of respondents indicated that they work for only one employer. Those who do work for more than one employer have higher salaries and total cash compensation (see bottom tables).

Membership in Professional Organizations
(total sample)

Organization	Number of Respondents	Percent of Respondents
None	893	38.6%
USENIX/SAGE	1,268	54.8%
ACM	151	6.5%
IEEE	124	5.4%
Other:	177	7.6%
SAGE-AU	32	1.6%
Interex	17	0.7%
SAGE-WISE	6	0.3%
SANS	6	0.3%

Relationship of Memberships to 1999
Salary and Total Cash
(U.S. system administrators)

Organization	Mean Salary in U.S. Dollars	Total Cash in U.S. Dollars
None	$61,637	$65,226
USENIX/SAGE	$65,818	$73,990
IEEE	$72,433	$91,734

Do you work for more than one employer?
(total sample)

Response	Number of Respondents	Percent of Respondents
Yes	209	9.1%
No	2,096	90.9%

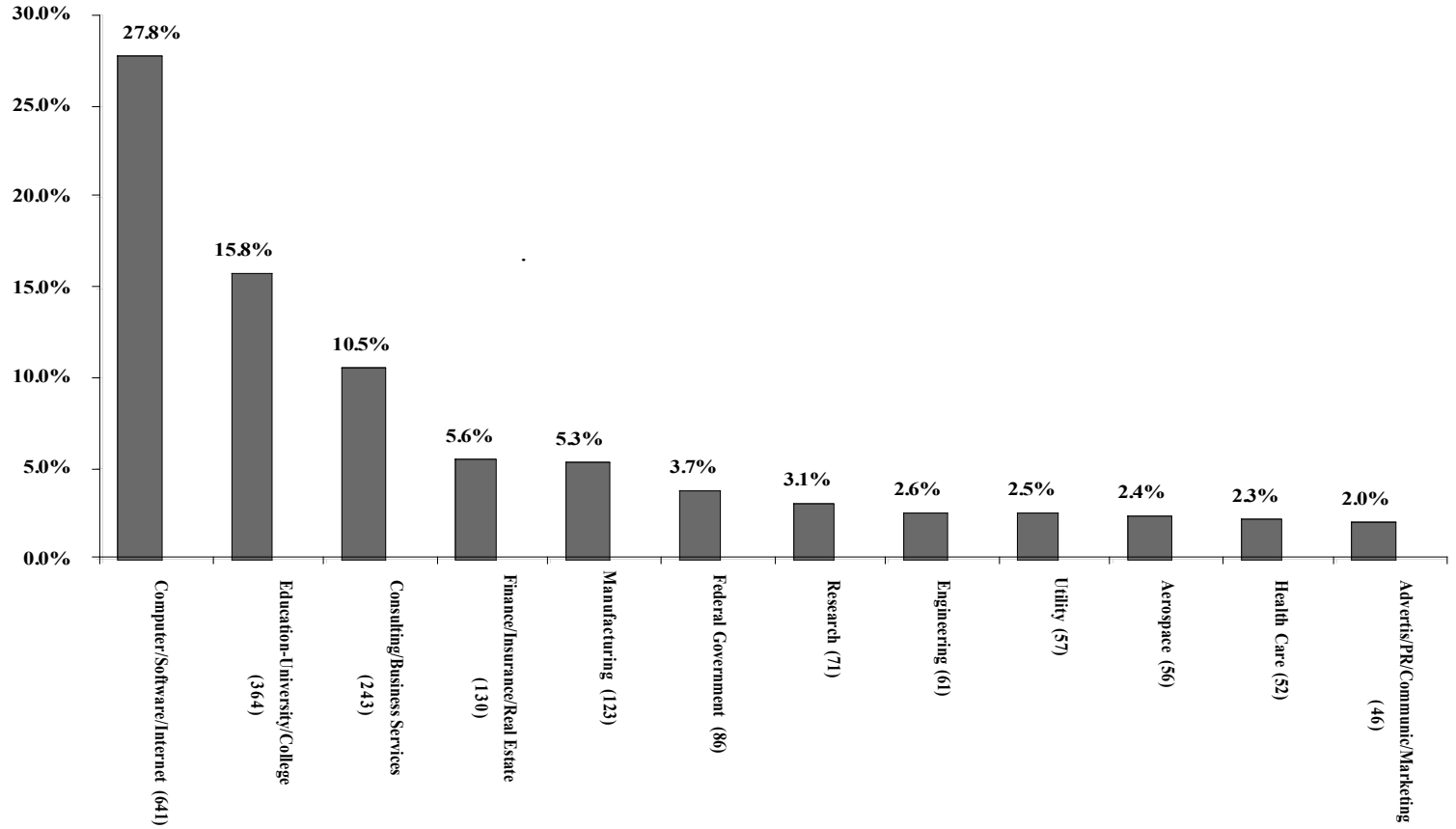
Relationship of Multiple Employers to
1999 Salary and Total Cash
(U.S. system administrators)

More Than 1 Employer	Mean Salary in U.S. Dollars	Total Cash in U.S. Dollars
No	$63,463	$69,589
Yes	$68,573	$75,622

RELATIONSHIPS BETWEEN ORGANIZATIONAL CHARACTERISTICS AND COMPENSATION

Industry

This chart shows percentages of respondents in industries that were 2% or more of the total sample. Over one-fourth of respondents were in the computer/software/internet industry. Respondents from other industries made up less than 2% of the total sample.



Number of respondents per category is in parentheses after category label on bottom axis. These results are based on U.S. and non-U.S. respondents

Compensation varied considerably by industry for U.S. system administrators. The median salary was lowest in state or local government and colleges or universities and highest in finance, insurance, and real estate and entertainment.

1999 Salary by Industry
(U.S. system administrators)

Industry	Number of Respondents	Mean Salary	10th Percentile	25th Percentile	50th Percentile (Median)	75th Percentile	90th Percentile
Advertising, Public Relations, Communication, or Marketing	35	$61,296	$41,200	$50,000	$59,000	$68,000	$83,800
Aerospace	40	$70,211	$51,300	$60,750	$70,000	$81,500	$89,600
Agriculture, Environmental Services, Mining, or Energy Production	14	$69,971	*	$57,250	$67,800	$82,250	*
Biotechnology	24	$68,900	$35,500	$58,200	$71,000	$84,000	$92,500
Consulting and Business Services	197	$70,930	$48,800	$55,500	$67,000	$78,000	$95,000
Computer, Software, and/or Internet	433	$66,916	$42,000	$51,000	$66,000	$80,000	$91,600
Education - College or University	265	$52,417	$35,150	$42,000	$50,000	$61,700	$71,880
Engineering	47	$68,783	$45,461	$57,500	$67,000	$80,000	$92,000
Entertainment	17	$75,324	$45,800	$61,500	$80,000	$89,000	$98,000
Federal Government, Nonmilitary	58	$63,296	$44,950	$49,800	$63,500	$78,000	$84,100
Finance, Insurance, and Real Estate	84	$73,214	$53,000	$60,875	$71,500	$82,000	$95,000
Health Care/Medicine	42	$59,613	$40,030	$46,750	$56,500	$72,250	$79,625
Manufacturing	95	$63,635	$42,000	$53,000	$64,000	$73,000	$84,400
Military	22	$55,018	$21,540	$35,125	$58,500	$71,525	$81,750
Not-for-Profit	13	$57,823	*	$43,500	$55,000	$72,500	*
Pharmaceuticals	19	$74,510	$50,000	$60,000	$70,000	$77,000	$110,000
Publishing	23	$60,945	$39,100	$51,000	$60,000	$72,000	$86,400
Research	54	$61,591	$42,250	$46,875	$59,800	$68,723	$89,000
Retail and Wholesale Trade	31	$56,138	$37,000	$41,545	$58,000	$65,500	$77,000
State or Local Government	22	$51,806	$33,778	$43,663	$49,000	$60,125	$67,160
Transportation	13	$57,540	*	$49,000	$52,500	$70,000	*
Utility	38	$66,871	$46,430	$55,000	$67,820	$78,588	$90,000

*Sample size too small.

The same industries that had the lowest and highest median salary also had the lowest and highest median total cash.

1999 Total Cash by Industry
(U.S. system administrators)

Industry	Number of Respondents	Mean Salary	10th Percentile	25th Percentile	50th Percentile (Median)	75th Percentile	90th Percentile
Advertising, Public Relations, Communication, or Marketing	33	$66,858	$41,000	$50,500	$60,000	$76,000	$98,054
Aerospace	39	$76,063	$55,000	$63,000	$75,000	$85,000	$110,000
Agriculture, Environmental Services, Mining, or Energy Production	14	$77,429	*	$64,750	$73,500	$85,500	*
Biotechnology	23	$75,348	$35,700	$58,500	$75,000	$90,000	$113,000
Consulting and Business Services	193	$76,319	$49,890	$59,500	$72,185	$88,000	$103,600
Computer, Software, and/or Internet	422	$79,990	$42,300	$55,000	$72,000	$86,000	$105,000
Education - College or University	259	$53,025	$35,324	$42,000	$52,000	$62,000	$73,000
Engineering	45	$74,494	$48,600	$59,250	$75,000	$87,000	$102,600
Entertainment	18	$75,939	$41,000	$64,500	$77,500	$100,500	$108,200
Federal Government, Nonmilitary	58	$65,959	$45,000	$50,000	$65,000	$81,500	$87,600
Finance, Insurance, and Real Estate	84	$77,241	$51,000	$65,000	$77,250	$91,875	$110,000
Health Care/Medicine	42	$59,839	$41,300	$46,750	$59,013	$71,650	$82,910
Manufacturing	95	$68,735	$43,600	$54,200	$69,000	$80,000	$100,000
Military	22	$59,614	$25,750	$38,750	$60,750	$82,625	$90,000
Not-for-Profit	13	$62,900	*	$42,500	$57,200	$80,500	*
Pharmaceuticals	17	$82,176	$48,400	$65,000	$73,000	$96,500	$132,400
Publishing	23	$65,604	$39,100	$52,000	$64,000	$79,000	$90,000
Research	54	$62,675	$40,800	$47,000	$63,000	$70,500	$89,000
Retail and Wholesale Trade	32	$64,953	$37,000	$44,000	$59,000	$73,500	$90,000
State or Local Government	20	$51,586	$32,593	$45,000	$48,500	$59,975	$66,000
Transportation	13	$66,400	*	$53,750	$60,000	$85,500	*
Utility	38	$75,108	$51,400	$60,000	$71,000	$92,250	$102,400

*Sample size too small. Total cash may be lower than salary at some percentiles because respondents were reporting base salary as of the 4th quarter of 1999, while total cash can represent an average of the 4th quarter salary and a lower salary from earlier in 1999, before a pay increase was received.

For many industries less than half of respondents had received a bonus.

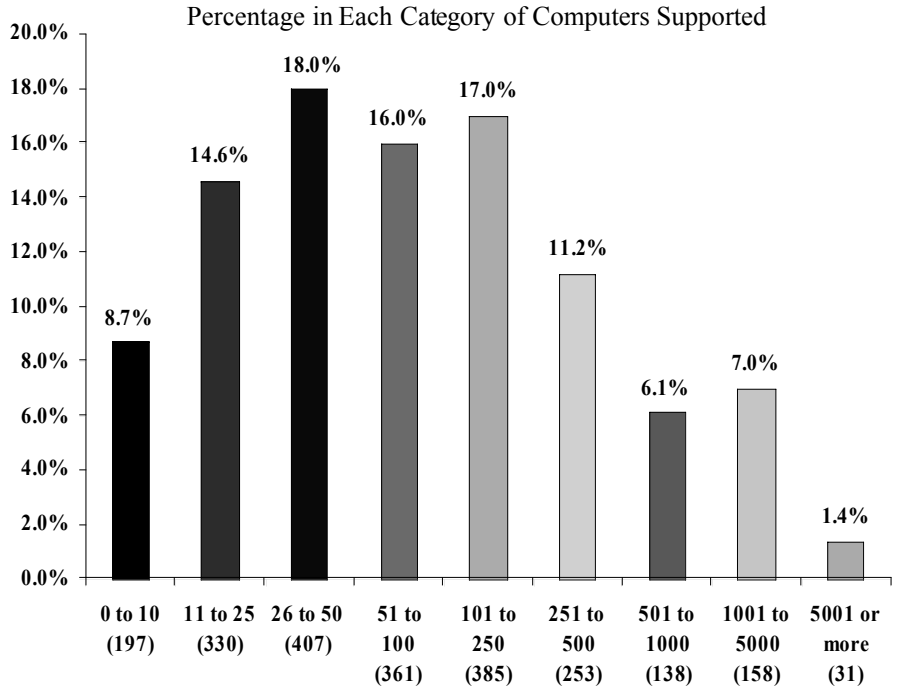
1999 Bonus by Industry
(U.S. system administrators)

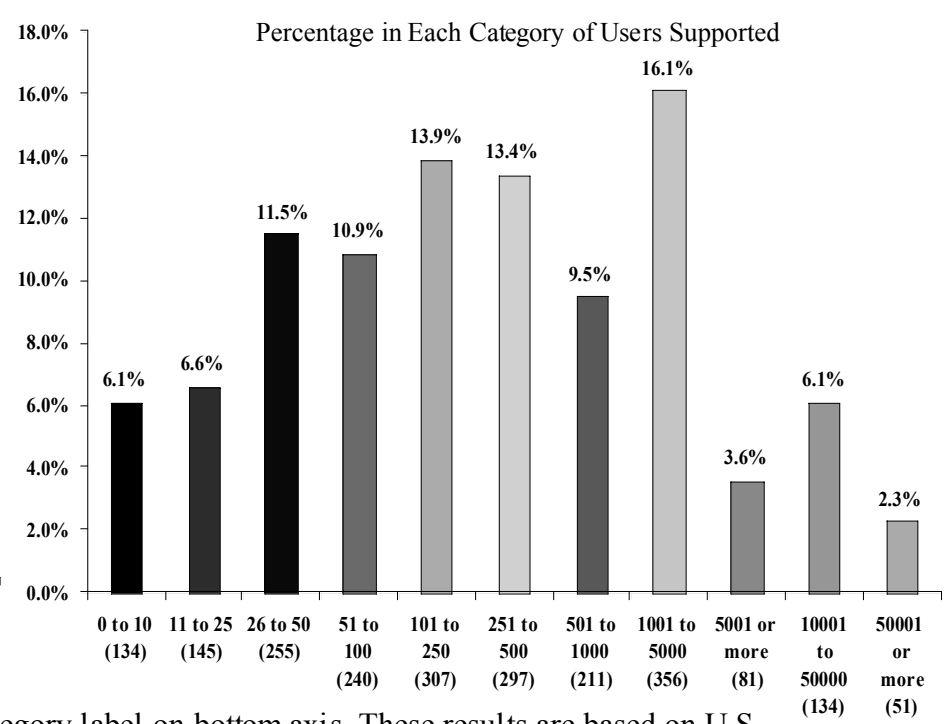
Industry	Number of Respondents	Mean Salary	10th Percentile	25th Percentile	50th Percentile (Median)	75th Percentile	90th Percentile
Advertising, Public Relations, Communication, or Marketing	35	$3,855	$0	$0	$750	$8,025	$14,158
Aerospace	40	$1,739	$0	$0	$0	$2,000	$5,000
Agriculture, Environmental Services, Mining, or Energy Production	14	$3,893	*	$250	$4,000	$6,500	*
Biotechnology	24	$3,457	$0	$0	$1,350	$4,950	$12,000
Consulting and Business Services	197	$4,952	$0	$0	$1,100	$8,000	$14,000
Computer, Software, and/or Internet	440	$4,276	$0	$0	$500	$5,000	$12,000
Education - College or University	267	$308	$0	$0	$0	$0	$1,000
Engineering	48	$3,807	$0	$0	$500	$4,000	$10,950
Entertainment	18	$4,133	$0	$0	$0	$2,550	$25,600
Federal Government, Nonmilitary	58	$936	$0	$0	$0	$1,000	$4,000
Finance, Insurance, and Real Estate	84	$6,100	$0	$0	$3,000	$10,000	$15,110
Health Care/Medicine	43	$888	$0	$0	$0	$1,000	$4,000
Manufacturing	96	$4,973	$0	$0	$1,000	$3,500	$10,000
Military	23	$1,098	$0	$0	$0	$1,500	$3,600
Not-for-Profit	14	$5,596	*	$0	$0	$2,475	*
Pharmaceuticals	19	$3,042	$0	$0	$2,000	$4,500	$12,000
Publishing	23	$2,239	$0	$0	$1,000	$2,700	$7,000
Research	54	$831	$0	$0	$0	$250	$1,900
Retail and Wholesale Trade	32	$9,797	$0	$0	$0	$3,750	$10,600
State or Local Government	22	$341	$0	$0	$0	$0	$2,400
Transportation	13	$6,431	*	$0	$3,500	$15,500	*
Utility	38	$4,575	$0	$104	$2,750	$9,125	$12,000

*Sample size too small.

Number of Computers and Users Supported

The survey asked, "How many computers (e.g., PCs, workstations, mainframes) do you support?" as one measure of the size of operation for which the respondent worked. The mean was 534, although this was influenced by a few respondents with particularly high numbers. For about three-fourths of respondents, their answer was 250 or fewer computers (250 was the 75th percentile). Responses were not significantly related to compensation levels. The survey also asked, "How many users do you support?" The mean was 258,040, but, just as with number of computers supported, this was influenced by a few respondents with particularly high numbers. For over three-fourths of respondents, the answer was 1,500 or fewer. For half of respondents, the answer was 300 or fewer (i.e., the median was 300). Responses were not significantly related to compensation levels. The mean number of network/system administrators in the facility where respondents worked was 19.4. Over half of respondents indicated that there were 5 or fewer, and over 75% indicated that there were 12 or fewer. A facility was defined as "the location where you work or the area or region of the organization for which you have responsibilities." The number of network/system administrators, number of computers per administrator, and number of users per administrator were not significantly related to the compensation levels of system administrators.





Number of respondents per category is in parentheses after category label on bottom axis. These results are based on U.S. and non-U.S. respondents

Organizational Size

Respondents' reported that their employers had anywhere from 1 to 1,000,000 employees worldwide. The mean was 21,628. Half of the sample reported 2,400 or fewer employees in their organization. Often, in compensation research, one finds a positive relationship between organizational size and pay level. For this survey, the relationship was positive, but relatively weak. Those in organizations with one employee made higher salaries, on average, than those in organizations with 2 to 10 employees. Those in organizations from 501 to 10,000 employees averaged less salary than those in organizations with 51 to 500 employees. Organizational size was not significantly related to total cash compensation or size of bonus, although those in larger organizations were more likely to get a bonus. In organizations with 1 to 10 employees, 37.1% received a bonus. In organizations with from 11 to 10,000 employees, between 45 and 50% of respondents reported a bonus. In organizations with 10,000 or more employees, 62.8% of respondents reported a bonus. (Organizational size was positively related to the level of benefits received, for some benefits. See the section on benefits for more information.)

1999 Salary by Organization Size
(U.S. system administrators)

Number of Employees	Percent of Responses	Mean Salary in U.S. Dollars
1	0.5%	$58,788
2-10	1.8%	$48,032
11-50	7.1%	$61,356
51-500	25.9%	$64,174
501-10,000	37.2%	$62,478
10,001 or more	27.5%	$67,941

Difficulty Filling System Administrator Positions

The majority of U.S. respondents (71.9%) said that their organization has difficulty filling all of the system administrator positions it would like to fill; 17.9% answered "no" and 10.2% answered "not sure" to this question. This differed by industry and by city.

Difficulty Filling System Administrator Positions by Industry
(U.S. system administrators)

Industry	Percentage of Respondents Who Say Their Organization Has Difficulty
Retail and Wholesale Trade	81.2%
Consulting and Business Services	79.0%
Federal Government, Nonmilitary	78.0%
Aerospace	77.5%
Education - College or University	76.8%
Advertising, Public Relations, Communication, or Marketing	75.7%
Research	74.5%
Manufacturing	74.0%
Military	73.9%
Pharmaceuticals	73.7%
State or Local Government	72.7%
Entertainment	72.2%
Finance, Insurance, and Real Estate	71.6%
Engineering	70.8%
Publishing	69.6%
Computer, Software, and/or Internet	68.0%
Health Care/Medicine	67.4%
Biotechnology	66.7%
Utility	57.9%
Transportation	53.8%
Agriculture, Environmental Services, Mining, or Energy Production	50.0%
Not-for-Profit	42.9%
Mean Across Industries	71.9%

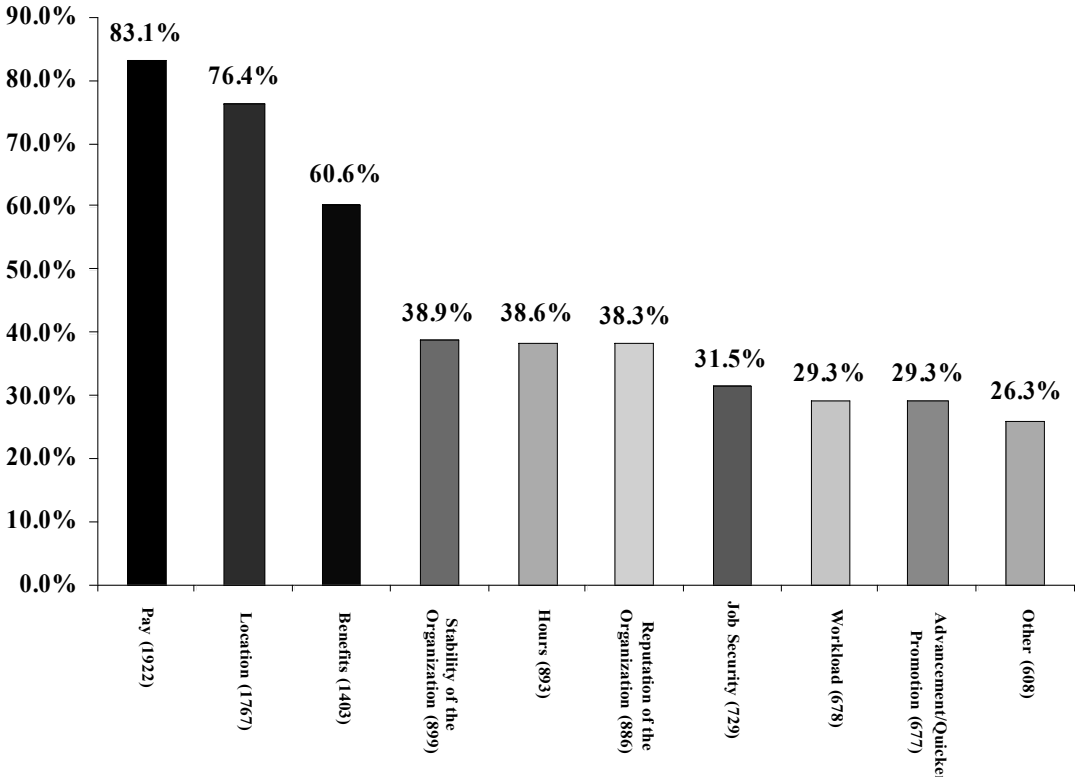
Difficulty Filling System Administrator Positions by Selected U.S. Cities

City	Percentage of Respondents Who Say Their Organization Has Difficulty
San Diego, CA Metro Area	82.8%
Research Triangle, NC	78.3%
San Francisco/San Jose/Silicon Valley, CA Area	74.3%
Austin, TX Metro Area	73.3%
Washington, DC Metro Area	73.1%
Other NY Metro Area	72.5%
Manhattan, NY	72.0%
Boston, MA Metro Area	71.8%
Los Angeles/Orange Co., CA Metro Area	67.8%
Philadelphia, PA Metro Area	66.7%
Office is in U.S., But Not in One of Above Areas	71.1%
Mean for All U.S. Locations	71.9%

RESPONDENTS' FEELINGS ABOUT THEIR JOBS, ORGANIZATIONS AND THE FUTURE OF THE FIELD

The following chart displays the responses to the question: "If another organization offered you employment, what factors would be most important in making you think seriously about switching jobs?" Pay, location, and benefits were the top three choices.

For the 610 individuals in the total sample who answered "other" to the question about what would make them think about seriously switching jobs, the following types of write-in answers were most common (numbers in parentheses show the number giving that type of response):



The job itself - 256 respondents: work that is interesting, fun, satisfying, challenging, meaningful, or provides learning, creativity, autonomy, or variety.

The organization - 96 respondents: good climate, culture, morale; type of organization or its goals.

Benefits - 90 respondents: paid training, paid conference attendance, tuition assistance, or assistance for obtaining certification; amount of vacation.

Managers and coworkers - 72 respondents: friendly, competent, cooperative, intelligent coworkers; competent, quality, clueful managers; proper treatment, respect.

Working conditions - 59 respondents: amount of travel; flextime; telecommuting; family friendly policies.

Technology - 37 respondents: cutting-edge technology or preferences for/against particular products.

Compensation - 31 respondents: stock, options, equity, or getting in on a pre-IPO (initial public offering) or startup.

Number of respondents per category is in parentheses after category label on bottom axis. These results are based on U.S. and non-U.S. respondents

Expectation About Being a System Administrator in Five Years

Over three-fourths (80.1%) of system administrators who responded indicated that they still expect to be a system administrator in five years. The percentage for female system administrators (73.2%) was significantly lower than for males (81.6%). The percentage for those who receive overtime pay was higher (87.1%) than for those who do not receive overtime pay (79.2%, U.S. respondents only). The higher the hierarchical level of respondents, the less likely they were to say they expect to be a system administrator in five years. Of those at the first hierarchical level, 82.0% said they do expect to be a system administrator in five years; for those at the fifth or higher level, 70.0% said they expect to be a system administrator in five years. All independent self-employed consultants in the U.S. said they expect to be a system administrator in five years, whereas 85.1% of contractors and 79.7% of salaried system administrators said they expect to be a system administrator in five years.

Expect to be a System Administrator in Five Years
(total sample of system administrators)

Response	Number of Respondents	Percent of Respondents
Yes	1,623	80.1%
No	402	19.9%

Hierarchical Level by Percent who Expect to be
A System Administrator in Five Years
(total sample of system administrators)

Response	Number of Respondents	Percent Who Say Yes
1st level	709	82%
2nd level	717	80%
3rd level	382	80%
4th level	121	72%
5th level or higher	44	70%

Special Benefits or Working Conditions that Respondents Particularly Like

Almost half of all respondents (44.6%) wrote in a response to the question, "Does your organization provide any special benefits or working conditions that you particularly like?" Of the 1,031 responses, 23% (242) mentioned work schedules and hours. The most common categories included:

242 - Work schedules - 213 mentioned flexible hours; several described schedules as "very" or "extremely" flexible and some mentioned ability to attend school. Other comments mentioned working a compressed work week (4 days/40 hours, 3 days/36 hours, 9 days/80 hours).

150 - Characteristics of the work - having a variety of systems or tasks; autonomy; learning; enjoying the work; ability to innovate and develop ideas; challenge; meaningful work; only using open source software; working for a not-for-profit; and having responsibility or ability to control or influence decisions.

121 - Culture/atmosphere - an organization that is university-like, noncorporate, adult, casual, friendly, not bureaucratic, and/or not hierarchical.

97 - Managers, coworkers and users - good managers; respect; getting to work with scientists, other system administrators, or engineers; working with knowledgeable, smart, collaborative, friendly, cool, fun, and/or team-oriented coworkers; and having good users.

88 - Equipment for home offices provided by the employer - free internet service, ISDN lines, laptops, cell phones, PCs, etc.

84 - Casual dress or lack of a dress code.

78 - Free beverages and food.

76 - Telecommuting - comments mentioned being able to work at home all or part of the time or even working in a different city.

64 - Technology - access to new technology, good equipment or connections, good budgets, use of Unix or Linux, good vendor support, and open access to the internet.

61 - Compensation - good pay; special recognition schemes; extra pay for developing open-source software or recruiting; good stock, options, or profit sharing; gainsharing; getting a paid lunch hour; and getting paid overtime or receiving compensatory time for working overtime

57 - Benefits - excellent benefits overall or specific benefit plans they like, such as retirement (the amount of money contributed, number of investment options), sick leave (no fixed number of days, ability to contribute to a sick leave pool for those in need), full benefits with part time work, flexible benefit plans, flexible spending accounts, a sick child care program, family leave, and sabbaticals. Vacations, including comments about having four or more weeks, liking academic vacation schedules, and the ability to cash out vacation days or purchase more vacation days.

50 - Training and development - half mentioned training, including comments like "unlimited" or "loads of," or mentioning in-house or on-line training. Tuition assistance. Rewards for professional development or certification, paid conferences, and professional development speakers.

Most Problematic/Bothersome Aspects of the Job

1,339 respondents in the total sample (57.9%) provided some answer for the question, "What aspect of your job do you find most bothersome or problematic?" Topics mentioned were very similar to those mentioned under the item on special benefits or working conditions that were particularly liked.

278 - Management -"Dilbertesque" management style, lack of enforcement of policies, micromanagement, lack of management understanding of department needs, lack of management support for initiatives, or management that is stubborn or out-of-touch; technical decisions being made by non-technical people such as financial officers, and management ignoring or not seeking input from those in the field who are directly impacted by the decisions; disorganization, a lack of planning, and making the same mistakes over and over; being asked to support all types of equipment, even if not knowledgeable about it; a lack of vision or leadership, constantly changing priorities, and poor implementation of corporate initiatives; communication problems; lack of respect or appreciation.

234 - Work schedules and workload - long hours, being on call, and changing schedules; the difficulties of getting other job tasks done, "having a life," and scheduling personal time when one is always expected to be on call; heavy workload, not enough time to do all that is expected, intermittent or irregular work flow (sometimes a crisis time and other times nothing to do); and the difficulty of keeping up with ever-changing technology.

151 - Culture/atmosphere - office politics and bureaucracy; negative organizational change, in some cases as a result of mergers and acquisitions; problems with organizational structure and lack of consistency among departments.

112 - Compensation - no on-call or overtime pay; salary lower than the market; salary inequities for different people in the same job.

101 - Technology and resources - lack of funding for needed equipment; purchase of improper hardware/software; having to move machines; use of poor quality applications; lack of help desk or end user support.

97 - Characteristics of the work - boring assignments, too much routine, menial tasks, and lack of challenge; administrative tasks like meetings, report writing, and filing; interruptions due to the amount of e-mail, petty user problems, and fire fighting; tasks assigned with no regard for skill, preference, or workload.

91 - Users and clients - asking "stupid" questions, not using resources provided to solve problems themselves, not anticipating needs ahead of time, expecting immediate results, being indecisive, having unreasonable expectations, or being slow to pay.

76 - Training and development - lack of time, money, or opportunity for formal or informal training; lack of opportunity to learn from others on the job or difficulty getting professional development activities approved; lack of career development, including no opportunity for advancement, career path, or technical track for advancement.

70 - Understaffing - not having enough staff to do the work, difficulty in recruiting and filling positions, and problems with retention and inexperienced staff.

50 - Commuting and travel - long commutes, extensive travel, having to travel with little notice, and inability to telecommute.

Thoughts on the Future of System Administration

Seventy-two respondents commented about the future of system administration. The following list describes the types of comments respondents provided on the subject of the future of system administration.

17 - Simplification - seven comments talked about the field being "dumbed down" and being replaced by "operators" with "cookbooks." Six talked about simplification of computer systems in a positive light, saying they hope the need for system administrators will level off as systems are easier to install and manage and people become more educated. Two expressed a need for providing a framework to automate tools to a customer's specifications or helping to figure out what needs to be done, rather than just automating processes. Another comment mentioned that the simplification of processes that one would expect has not occurred.

15 - Optimism about the field - comments expressed belief in a bright future for the field or a long future for the field. Some said they think the field will always exist and there will be opportunity because not everyone wants to do this type of work.

13 - Shift toward breadth vs. specialization - six comments expressed the belief that breadth of knowledge (multiple operating systems, both hardware and software, being a jack of all trades) is increasingly important. Two mentioned expectations of more specialization, and five talked about the need to move into system architecture and design and the blurring of system administration and network engineering.

7 - Need for greater knowledge of business - these comments talked about the importance of understanding how the field fits into a business and can add value to a business, the need to present a professional image, and the importance of communication, organizational, and problem solving skills.

4 - Negative feelings about quality of system administrators - concerns expressed included feeling that new system administrators do not have a sense of ethics and that organizations are replacing experienced system administrators with those who are untrained and inexperienced.

4 - Necessity of going into management - these comments discussed the fear that one must go into management to advance or increase one's income; one comment suggested that organizations need to reward employees for technical contributions, without requiring them to enter

FACTORS WITH THE STRONGEST RELATIONSHIP TO COMPENSATION

Regression analyses were used to determine which of the various job, organizational, and personal background characteristics measured on the SAGE System Administrator Salary Profile were most strongly related to salary, total cash, and bonuses. In regression equations all of the characteristics could be included simultaneously in the same analysis.

The regression equation for salary indicated that 52.0% of the variation in salary levels among U.S. respondents to the survey could be accounted for by characteristics measured on the SAGE Profile. The regression equation for total cash indicated that 23.4% of the variation in amounts of total cash and 8% of the variation in bonuses of U.S. respondents could be accounted for by the same set of characteristics. These results suggest that it is easier to account for the amount of salary a system administrator receives with the types of information measured on the profile than it is to account for the amount of total cash or size of bonus. Results should not be interpreted to mean that these factors necessarily *cause* higher or lower salaries, but that they are related to higher or lower salaries.

Salary

In the regression equation for salary, these variables or factors had a statistically significant relationship with the amount of salary U.S. respondents earned. On average, these factors were related to making this much more (+) or less (-) salary:

Being a consultant, rather than salaried	+ $27,821
Being a contractor, rather than salaried	+ $ 9,451
Each higher level of responsibility respondents could use to describe their job (The SAGE Profile described four levels of responsibility from "Perform routine tasks" to "Work under general direction from senior management.")	+ $ 4,475
Each higher hierarchical level out of the number of levels respondents said there were for system administrators in their organization	+ $ 2,316
Facilities management as a major job responsibility	+ $ 1,503
Help desk as a major job responsibility	- $ 1,921
Working for more than one employer, compared to working for one	+ $ 3,045
Getting paid overtime for hours exceeding 40 per week	+ $ 2,675
Each additional hour per week worked	+ $ 144
Men compared to women	+ $ 3,531
For each year of age	+ $ 252

Salary (continued)

Each additional employer worked for during one's career	+ $ 1,164
Each additional year of system administration experience	+ $ 905
Having some college compared to having a bachelor's degree	- $ 4,016
Having an associate's degree compared to having a bachelor's degree	- $ 6,758
Working in Manhattan, NY, compared to other areas of the U.S.	+$ 20,000
Working in the San Francisco Metro area compared to others in the U.S.	+ $13,397
Working in other New York Metro areas compared to others in the U.S.	+ $ 6,951
Working in the Philadelphia Metro area compared to others in the U.S.	+ $ 7,702
Working in the Boston Metro area compared to others in the U.S.	+ $ 7,177
Working in the Washington D.C. Metro area compared to others in the U.S.	+ $ 6,230
Working in the Midwest compared to the Southwest	- $ 3,024
Working in the Northeast compared to the Southwest	- $ 3,558
Working with Net BSD	+ $ 2,769
Working with Solaris	+ $ 1,734
Working with Free BSD	- $ 2,625
Working with Open BSD	- $ 2,761
Working with DOS/Win 3.1	- $ 3,368
Working in the Research Industry	- $ 6,155
Working for the Federal Government/Nonmilitary	- $ 8,631
Working for the Military	- $10,800
Working for a University/College	- $11,667
Working for a State/Local Government	- $12,245

Factors not significantly related to salary in the regression equation were: other major job responsibilities (besides help desk and facilities management), number of employees one supervises, number of operating systems at the facility where one works, having a computer-related education, years worked for one's employer, membership in professional organizations, number of computers or users supported, number of employees or system administrators in one's organization, whether one's organization has a hard time filling system administrator positions, whether the organization pays for shift work, being on call/wearing a pager, other operating systems supported besides those above, having a certification, and being in another industry besides those mentioned above.

Total Cash

In the regression equation for total cash, fewer factors had a statistically significant relationship than in the results for salary:

Working in Manhattan, NY, compared to other areas of the U.S.	+ $29,073
Working in the San Francisco Metro area compared to others in the U.S.	+ $28,125
Being a consultant, rather than salaried	+ $25,650
Being a member of IEEE	+ $ 6,621
Working with BSDI	+ $ 5,872
Each higher level of responsibility respondents could use to describe their job. (The SAGE profile described 4 levels of responsibility from "Perform routine tasks" to "Work under general direction from senior management. ")	+ $ 4,547
Each higher hierarchical level out of the number of levels respondents said there were in their organization	+ $ 4,098
Each additional employer worked for during one's career	+ $ 2,144
Each additional year of system administration experience	+ $ 1,920
Help desk as a major job responsibility	- $ 2,987
Working with Free BSD	- $ 4,069
Working for a University/College	- $13,469

Bonus

Only five factors were significantly related to the size of bonus in the regression equation which considered all factors simultaneously:

Working for an organization in the Retail Industry	+ $7,243
Females relative to males	+ $1,974
Each higher hierarchical level out of the number of levels respondents said there were in their organization	+ $ 878
Getting paid for overtime hours worked over 40 hours per week	- $ 1,700
Working for a University/College	- $ 3,056

None of the other factors significantly accounted for differences in the size of total cash or bonus when included in the regression with the above factors. All of the same factors that were included in the equation for salary were included in these equations. The regression on salary indicates that, even after controlling for other factors such as years of experience, education, and organizational level, female system administrators made less salary than male system administrators. However, the regression on bonuses suggests that women made higher bonuses, when one took the other factors in the equation into account. The results from the regression on total cash suggest that lower salaries and higher bonuses resulted in no significant difference in total cash for the two sexes, after taking the other factors in the equation into account. It should be noted, though, that other factors that were not included in the SAGE Profile and regression equations might account for some of the differences between males' and females' salary and bonus levels.

BENEFITS

Paid Training and Time Off

For respondents who were system administrators in the U.S., half received 15 or fewer days vacation, 6 or fewer days sick leave, 9 or fewer paid holidays, and 7 or fewer days of paid training; half of respondents received this number of paid days or more for each type of paid time off.

Distribution of Days of Paid Training and Time Off in the U.S.
(full-time U.S. system administrators)

Item	Mean	10th Percentile	25th Percentile	50th Percentile (Median)	75th Percentile	90th Percentile
Number of Days of Paid Vacation Per Year	15.4	5.0	10.0	15.0	20.0	24.0
Number of Days of Paid Sick Leave Per Year	11.1	0.0	2.0	6.0	12.0	15.0
Number of Paid Holidays Per Year	8.8	5.0	7.0	9.0	11.0	12.0
Number of Days of Paid Training Per Year	8.3	0.0	5.0	7.0	10.0	15.0

There was greater variation among U.S. industries for mean paid vacation days and sick leave days than for paid holidays and paid training days. Paid vacation days ranged from 10.5 to 19.2, holidays from 6.7 to 11.1, sick leave from 4.7 to 15.5, and training days from 5.6 to 19.7 (the military had a much higher number of paid training days; the second highest was 10.2, and most industries were between 5.6 and 10.2).

Paid Training and Time Off by Industry
(full-time U.S. system administrators)

Industry	Mean Number of Paid Vacation Days	Mean Number of Paid Holidays	Mean Number of Sick Leave Days	Mean Number of Paid Training Days
Advertising, Public Relations, Communication, or Marketing	11.3	7.6	7.6	7.1
Aerospace	14.2	10.3	6.7	7.5
Agriculture, Environmental Services, Mining, or Energy Production	17.4	9.3	13.9	8.6
Biotechnology	13.5	10.6	10.8	8.8
Consulting and Business Services	13.2	8.0	5.2	7.8
Computer, Software, and/or Internet	12.6	8.2	6.2	8.8
Education - College or University	18.4	10.0	12.5	6.7
Engineering	13.0	9.7	6.8	8.7
Entertainment	11.8	9.3	8.4	5.6
Federal Government, Nonmilitary	18.0	10.1	8.9	9.1
Finance, Insurance, and Real Estate	14.2	8.5	6.6	9.4
Health Care/Medicine	17.6	7.3	4.7	6.5
Manufacturing	12.4	8.4	6.1	8.7
Military	19.2	10.4	5.6	19.7
Not-for-Profit	18.2	11.1	15.5	6.7
Pharmaceuticals	11.9	9.0	7.4	8.9
Publishing	12.7	8.9	4.8	9.1
Research	17.8	9.1	12.7	8.0
Retail and Wholesale Trade	11.7	6.7	6.1	8.9
State or Local Government	14.5	10.1	10.8	9.8
Transportation	10.5	7.8	7.7	8.0
Utility	14.8	8.3	6.2	10.2

Retirement Plans

Two types of plans employers use to fund retirement systems are "defined contribution" and "defined benefit" plans. In defined contribution plans, employers contribute a particular amount of money or percent of salary into a plan during the a year, and it is invested until an employee retires. The amount the employee receives when he/she is retired depends on how much it has increased over the years from the way it was invested. In the U.S., 401k and 403b plans are defined contribution plans, and employees can have the funds in these plans placed in such investments as mutual and money market funds. A defined benefit plan is what is commonly known as a pension. With a defined benefit plan, an employer agrees to pay a certain amount of salary once the employee is retired. This amount is not based on how it was invested over the years before retirement. Defined contribution plans have been on the increase and defined benefit plans on the decrease in the U.S. in recent years. On this survey, twice as many U.S. system administrators were covered by defined contribution plans as were covered by defined benefit plans. The mean percentage of salary contributed to a defined contribution type of retirement plan by their employer was 9.5%. Ten percent of respondents received 2% or less; 25% received 3% or less; 50% received 5% or less; and 75% received 8% or less. The top 10% reported 17% or higher contributions to their retirement plan by their employer. There was considerable variation among U.S. industries.

Retirement Plans by Industry
(full-time U.S. system administrators)

Industry	Percentage with a Defined Benefit or Pension Plan	Percentage with a Defined Contribution Plan (e.g., 401k, 403b)	Mean Percent of Salary Employer Contributes to a Defined Contribution Plan
Advertising, P. Relations, Communication, Marketing	27.8%	80.6%	7.1%
Aerospace	66.7%	84.6%	10.7%
Agriculture, Environmental Services, Mining, Energy	64.3%	92.9%	7.6%
Biotechnology	10.0%	85.0%	4.2%
Consulting and Business Services	15.3%	71.4%	10.0%
Computer, Software, and/or Internet	14.0%	66.6%	10.8%
Education - College or University	53.9%	66.5%	9.4%
Engineering	27.7%	79.2%	8.5%
Entertainment	11.1%	61.1%	13.5%
Federal Government, Nonmilitary	44.6%	85.7%	8.3%
Finance, Insurance, and Real Estate	51.8%	76.7%	7.4%
Health Care/Medicine	47.6%	69.0%	6.2%
Manufacturing	39.4%	80.0%	10.2%
Military	47.6%	72.7%	5.4%
Not-for-Profit	38.5%	61.5%	7.6%
Pharmaceuticals	27.8%	84.2%	4.5%
Publishing	34.8%	78.3%	7.2%
Research	42.3%	90.6%	8.9%
Retail and Wholesale Trade	22.6%	50.0%	11.1%
State or Local Government	81.0%	40.9%	6.5%
Transportation	46.2%	92.3%	11.5%
Utility	54.1%	81.6%	14.6%

Insurance Benefits

The majority of full-time U.S. system administrators have at least part of their health, dental, vision care, life, and disability insurance paid by employers. The proportion who received insurance paid in full by their employer varied by industry. State/local government, entertainment, and utilities were among the most generous in providing fully paid insurance, although this varied by type of insurance. (Percentage who said partly paid by employer for industry can be found by subtracting "not paid" and "full paid" from 100%.)

Insurance Benefits by Industry (full-time U.S. system administrators)

Industry	Health Insurance	Dental Insurance	Vision Care Insurance	Disability Insurance	Life Insurance
Advertising, PR, Communication, Marketing					
Not paid by employer	2.8%	5.6%	22.2%	16.6%	19.4%
Fully paid by employer	27.8%	38.9%	30.6%	41.7%	30.6%
Aerospace					
Not paid by employer	0.0%	5.1%	23.1%	5.1%	5.1%
Fully paid by employer	23.1%	23.1%	12.8%	33.4%	38.5%
Agriculture, Environ. Svcs, Mining, Energy					
Not paid by employer	0.0%	0.0%	28.6%	7.2%	0.0%
Fully paid by employer	14.3%	14.3%	64.3%	21.4%	42.9%
Biotechnology					
Not paid by employer	0.0%	0.0%	15.0%	0.0%	10.0%
Fully paid by employer	40.0%	50.0%	45.0%	75.0%	65.0%
Consulting and Business Services					
Not paid by employer	3.5%	8.5%	59.8%	10.6%	13.6%
Fully paid by employer	42.7%	32.2%	11.1%	57.3%	53.2%
Computer, Software and/or Internet					
Not paid by employer	3.7%	8.1%	26.2%	21.8%	21.3%
Fully paid by employer	42.6%	38.2%	28.2%	43.5%	41.5%
Education - College or University					
Not paid by employer	2.0%	14.3%	31.3%	20.3%	14.3%
Fully paid by employer	28.8%	26.3%	21.4%	30.7%	35.1%
Engineering					
Not paid by employer	0.0%	6.3%	22.9%	6.3%	6.3%
Fully paid by employer	20.8%	25.0%	22.9%	35.4%	39.6%
Entertainment					
Not paid by employer	5.6%	5.6%	22.2%	22.2%	22.2%
Fully paid by employer	44.4%	50.0%	50.0%	44.5%	44.4%
Federal Government, Nonmilitary					
Not paid by employer	7.1%	16.1%	25.0%	21.4%	14.3%
Fully paid by employer	12.5%	17.9%	17.9%	14.3%	17.9%

Insurance Benefits by Industry (full-time U.S. system administrators)					
Industry	Health Insurance	Dental Insurance	Vision Care Insurance	Disability Insurance	Life Insurance
Finance, Insurance, and Real Estate					
Not paid by employer	7.0%	8.1%	36.0%	18.6%	11.6%
Fully paid by employer	16.3%	16.3%	8.1%	34.9%	37.2%
Health Care/Medicine					
Not paid by employer	4.8%	11.9%	33.3%	7.1%	14.3%
Fully paid by employer	23.8%	16.7%	33.3%	38.1%	38.1%
Manufacturing					
Not paid by employer	7.4%	11.6%	32.6%	12.6%	15.8%
Fully paid by employer	25.3%	24.2%	18.9%	35.8%	42.1%
Military					
Not paid by employer	4.5%	22.7%	31.8%	13.6%	9.1%
Fully paid by employer	22.7%	22.7%	22.7%	18.2%	45.5%
Not-for-Profit					
Not paid by employer	15.4%	23.1%	30.8%	7.6%	15.4%
Fully paid by employer	23.1%	15.4%	15.4%	46.2%	53.8%
Pharmaceuticals					
Not paid by employer	10.5%	15.8%	47.4%	26.3%	31.6%
Fully paid by employer	15.8%	21.1%	21.1%	47.4%	31.6%
Publishing					
Not paid by employer	0.0%	4.3%	17.4%	13.0%	4.3%
Fully paid by employer	34.8%	39.1%	13.0%	39.1%	34.8%
Research					
Not paid by employer	1.9%	1.9%	30.2%	11.3%	18.9%
Fully paid by employer	37.7%	43.4%	24.5%	45.3%	41.5%
Retail and Wholesale Trade					
Not paid by employer	3.1%	6.3%	43.8%	18.8%	15.6%
Fully paid by employer	28.1%	28.1%	18.8%	53.1%	59.4%
State or Local Government					
Not paid by employer	0.0%	9.1%	27.3%	27.3%	13.6%
Fully paid by employer	54.5%	54.5%	27.3%	45.5%	45.5%
Transportation					
Not paid by employer	0.0%	7.7%	15.4%	7.7%	15.4%
Fully paid by employer	38.5%	30.8%	15.4%	30.8%	15.4%
Utility					
Not paid by employer	7.9%	7.9%	21.1%	26.3%	10.5%
Fully paid by employer	47.4%	50.0%	31.6%	34.2%	36.8%

Other Benefits by Industry

The most generous industries in terms of paying for system administrators' association memberships were Biotechnology, Research, and Agriculture/Environmental Services/Mining/Energy Production. Over half in all industries, except Consulting and Business Services and Retail/Wholesale Trade, were in organizations that provided tuition assistance. The highest percentages of respondents who said their organization provided an employee stock ownership plan (ESOP) were in Biotechnology, Computer/Software/ Internet, and Engineering. In the U.S. overall, 25.1% said they get paid memberships, 61.5% tuition assistance, and 40.1% an ESOP. For U.S. system administrators, only 8.2% said received childcare assistance, while 34.6% said they could telecommute, and 53.2% said they had flextime. The percent who received childcare assistance tended to be low for all industries, with the highest percentage in Biotechnology. Percentages who said they could telecommute were highest in Biotechnology, Computer/Software/Internet, Pharmaceuticals, and Publishing and lowest in the Federal Government and Military.

Other Benefits by Industry
(full-time U.S. system administrators)

Industry	Percentage with Association Memberships Paid by Employer	Percentage who Receive Tuition Assistance from Employer	Percentage in an Organization with an Employee Stock Ownership Plan	Percentage who Receive Child-care Assistance	Percentage who May Telecommute	Percentage who May Use Flextime
Advertising, Public Relations, Communication, or Marketing	5.6%	22.2%	25.0%	19.4%	72.2%	50.0%
Aerospace	7.7%	35.9%	61.5%	25.6%	74.4%	38.5%
Agriculture, Environmental Services, Mining, or Energy Production	7.1%	28.6%	42.9%	42.9%	85.7%	42.9%
Biotechnology	30.0%	45.0%	60.0%	50.0%	50.0%	75.0%
Consulting and Business Services	6.0%	29.1%	42.2%	16.1%	43.2%	50.3%
Computer, Software, and/or Internet	8.1%	40.0%	50.2%	24.4%	55.6%	63.4%
Education - College or University	4.0%	34.5%	61.9%	28.4%	75.7%	1.2%
Engineering	16.7%	35.4%	62.5%	33.3%	72.9%	72.9%
Entertainment	11.1%	27.8%	38.9%	22.2%	55.6%	38.9%
Federal Government, Nonmilitary	7.1%	17.9%	66.1%	23.2%	73.2%	17.9%
Finance, Insurance, and Real Estate	16.3%	34.9%	58.1%	29.1%	61.6%	43.0%
Health Care/Medicine	7.1%	35.7%	52.4%	23.8%	54.8%	14.3%
Manufacturing	14.7%	36.8%	50.5%	22.1%	68.4%	49.5%
Military	0.0%	13.6%	45.5%	13.6%	68.2%	22.7%
Not-for-Profit	7.7%	30.8%	92.3%	23.1%	61.5%	0.0%
Pharmaceuticals	0.0%	42.1%	52.6%	26.3%	63.2%	57.9%
Publishing	13.0%	47.8%	56.5%	39.1%	60.9%	52.2%
Research	7.5%	34.0%	54.7%	45.3%	77.4%	20.8%
Retail and Wholesale Trade	3.1%	25.0%	46.9%	15.6%	43.8%	25.0%
State or Local Government	13.6%	22.7%	59.1%	31.8%	68.2%	9.1%
Transportation	0.0%	38.5%	84.6%	23.1%	53.8%	30.8%
Utility	7.9%	34.2%	60.5%	21.1%	73.7%	52.6%

Benefits and Organizational Size

Larger organizations often provide more generous benefit packages than smaller organizations. U.S. system administrators in organizations with more than 100 employees received more paid vacation, on average, than those with 2 to 100 employees. For organizations with 2 or more employees, the mean number of paid holidays, vacation days, and training days increased with the size of the organization, but there was not as clear a pattern of increase between organizational size and the mean number of paid sick leave days. The percentages of U.S. system administrators who reported that they have defined benefit or defined contribution retirement plans also increased with organizational size for those in organizations with more than 2 employees. The mean percent of salary contributed by the employer to a defined contribution plan did not show a clear pattern of increases with organizational size. There was not a clear pattern of increasing percentages of U.S. system administrators who reported having insurance partly or fully paid in organizations of increasing size. The percentage of U.S. system administrators who receive paid association memberships increased up through organizations with up to 100 employees, but after that there was no pattern of increase with size. However, there was a clear pattern of increasing percentages who received tuition assistance as organization size increased. The percent who reported having employee stock ownership plans increased up through organizations with up to 2,500 employees, but dipped for organizations with 2,501 to 50,000 employees. Percentages were highest for those with 50,000 or more employees. The percent who received childcare assistance from their employer increased for organizations as they increased in size from 2 through 100,000 or more. But percentages who can telecommute or use flextime were lower for organizations with 51 to 2,500 employees than for either smaller or larger organizations.

Paid Training and Time Off by Organizational Size
(full-time U.S. system administrators)

Number of Employees	Mean Number of Paid Vacation Days	Mean Number of Paid Holidays	Mean Number of Sick Leave Days	Mean Number of Paid Training Days
1	17.0	10.6	7.7	12.7
2 to 10	10.4	6.7	6.5	5.6
11 to 50	12.7	7.2	5.3	5.9
51 to 100	12.9	8.1	6.0	6.0
101 to 500	14.0	8.3	6.6	7.0
501 to 2,500	15.0	8.8	9.1	8.7
2,501 to 10,000	14.5	9.0	8.4	8.2
10,001 to 50,000	15.3	9.1	8.6	8.9
50,001 to 100,000	13.8	9.4	7.6	9.0
100,001 or more	14.6	9.1	6.3	12.5

Retirement Plans by Organizational Size
(full-time U.S. system administrators)

Number of Employees	Percentage with a Defined Benefit or Pension Plan	Percentage with a Defined Contribution Plan (e.g., 401k, 403b)	Mean Percent of Salary Employer Contributes to a Defined Contribution Plan
1	30.0%	36.4%	7.5%
2 to 10	3.2%	16.1%	5.0%
11 to 50	8.8%	41.4%	9.9%
51 to 100	18.1%	50.0%	9.7%
101 to 500	14.3%	65.8%	9.0%
501 to 2,500	27.1%	77.7%	10.5%
2,501 to 10,000	40.1%	75.4%	9.8%
10,001 to 50,000	50.8%	82.6%	8.3%
50,001 to 100,000	59.4%	78.6%	12.3%
100,001 or more	71.6%	87.8%	9.9%

Other Benefits by Organizational Size
(full-time U.S. system administrators)

Number of Employees	Percentage with Association Memberships Paid by Employer	Percentage who Receive Tuition Assistance from Employer	Percentage in an Organization with an Employee Stock Ownership Plan	Percentage Who Receive Child-Care Assistance	Percentage Who May Telecommute	Percentage May Use Flextime
1	9.1%	54.5%	9.1%	9.1%	45.5%	45.5%
2 to 10	16.1%	29.0%	29.0%	0.0%	54.8%	54.8%
11 to 50	25.0%	31.9%	31.9%	1.7%	34.5%	53.4%
51 to 100	29.7%	43.4%	35.5%	1.3%	22.4%	43.4%
101 to 500	19.8%	45.6%	43.2%	3.9%	25.8%	41.7%
501 to 2,500	30.3%	67.7%	48.6%	4.8%	31.5%	49.4%
2,501 to 10,000	26.6%	71.1%	32.9%	11.3%	35.0%	57.8%
10,001 to 50,000	29.3%	74.5%	42.4%	12.5%	39.4%	61.7%
50,001 to 100,000	28.6%	76.5%	55.1%	15.3%	43.9%	62.2%
100,001 or more	27.8%	72.2%	56.7%	18.9%	57.8%	71.1%