

The 2021 Open Source Jobs Report

9th Annual Report on Critical Skills,
Hiring Trends, and Education

September 2021

Presented By



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97% of hiring managers say **hiring open source talent is a priority**

P6



50% of hiring managers are **increasing open source hiring this year**

P5



88% of hiring managers **prioritize hiring certified professionals**

P7



3 in 5 professionals **increased cloud usage over the past year**

P10



88% of professionals **use DevOps practices in their work today**

P11



92% of hiring managers **report difficulty finding open source talent**

P13



58% of hiring managers are **increasing training for employees**

P13



2/3 of developers **need more training to do their jobs**

P15



72% of hiring managers are **more likely to hire someone with a certification**

P18



88% of hiring managers are **willing to pay for certifications**

P20



92% of hiring managers say **employees are requesting more training**

P19



54% of professionals work in open source because **they are passionate about it**

P22



44% of hiring managers **want staff who have contributed to open source projects**

P21



98% of hiring managers **proactively encourage diversity in hiring**

P24



1 in 5 professionals have been **discriminated against or felt unwelcome**

P25



455% increase in **demand for Kubernetes certifications** from 2019 to 2021

P9



41% say experience with **open cloud technologies most impacts hiring decisions**

P10



2 in 5 companies have **given open source higher raises** than other employees

P13



77% of employers **want open source training to be vendor-neutral**

P22



1/2 of pros ranked **ability to architect solutions based on open source** the top skill

P23

Foreword

Much of the world is rebounding from the economically crippling lockdowns of COVID-19, and hiring people with the right skills is proving to be a challenge. Nowhere is this more true than in the technology sector. The talent gap that existed before the pandemic has worsened due to an acceleration of cloud-native adoption as remote work has gone mainstream.

With data integrity, privacy, and security taking on even more outsized importance than in years past, sourcing richer technical talent has taken center stage. With talent shortages around the globe, training existing staff has become more important to meet the needs of migrations to the cloud and leverage open source technologies tied to those migrations. Beyond skill gaps, other challenges stand in the way. Today, a growing number of employees report discrimination in the open source community, despite employers insisting they have increased diversity efforts.

To shed light on these changes and challenges, the Linux Foundation, once again, teamed up with edX to produce our 9th annual Open Source Jobs Report. The 2021 report provides actionable insights on the state of open source talent that employers can use to inform their hiring, training, and diversity awareness efforts. This year's report includes survey findings and analysis generated from more than 200 technical hiring managers and 750 open source professionals worldwide.

This report provides IT professionals with clear, unbiased insights on which skills are most marketable. The findings come when increasing numbers of organizations have abandoned their college degree requirements, and candidates seek guidance on which skills they should develop to maximize their job prospects. This year's report also reveals how reskilling and certifications benefit job seekers as a differentiator in the hiring process.

This year's Open Source Jobs Report provides data on the specific areas where skill requirements are most acute. For instance, the report reveals that cloud-native skills are now more in demand than any other technical discipline, a finding that parallels the rapid migration to DevOps practices.

We hope you will find the 2021 Jobs Report helpful for hiring managers and professionals alike and encourage you to participate in future Linux Foundation research projects.

— **Clyde Seepersad**

*SVP & General Manager, Training & Certification,
The Linux Foundation*

The State of Open Source Employment in 2021

Hiring Landscape

As we continue to crawl our way out of COVID-19-induced economic lockdowns, the world has its sights firmly set on a post-pandemic world. However, the pandemic will have left its mark, including how we attract, hire, organize, and retain our teams. Think about how remote work environments—sure to be one of the pandemic’s legacies—have impacted HR policies and decision-making around their digital transformation. There should be no surprise that hiring environments specific to open source software and standards development would be affected accordingly.

This year brings no sign of an end to these trends. Where 2020 brought hiring urgency and a need to ramp up open source talent, 2021 looks to be the year of cautious rebalancing. Half of the managers

surveyed plan to increase their hiring of open source professionals in the next six months compared to the last six months; compare this to the 56% in 2020 and 52% in 2018 who planned to increase hiring.

Only 6% expect to hire fewer employees (up from 4% in 2020), and 1% expect to hire no open source pros at all. We believe the 2020 spike in demand was due to last year’s survey being conducted toward the end of the first wave of COVID-19 lockdowns, during which time the United Nations¹ was reporting economic activity rebounding globally.

As with the previous year, demand for open source talent is being driven primarily by organic growth within organizations, as reported by 50% of hiring

¹ <https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-july-2021-briefing-no-151/>

managers. The second most common response was that organizations had increased their use of open source, leading to talent shortages as reported by 38% of hiring managers. These are both consistent with a wider economic rebound, as organizations are again experiencing growth and continue to invest in digital transformation activities, which drives further open source adoption.

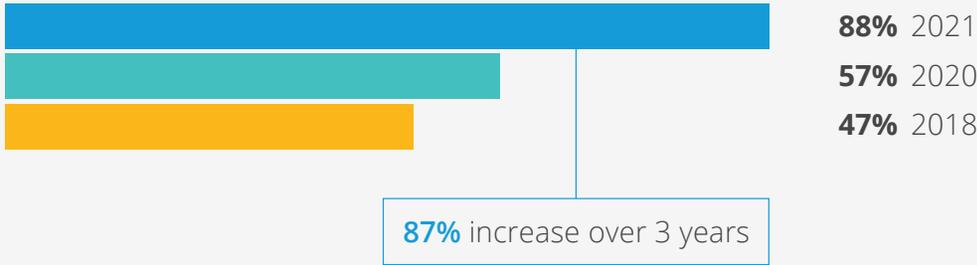
This year's survey data indicates that open source is the place to be, putting ever greater emphasis on the importance of having skills in the technology

development sector over almost any other. Hiring open source talent is a high priority for 97% of hiring managers surveyed in 2021, and they are more likely than ever to look for open source professionals who hold certifications. As shown in Figure 1, a majority (88%) stated that hiring certified professionals is a priority, an 87% increase in only three years (57% in 2020 and 47% in 2018). This increase in prioritizing certification by hiring managers makes sense considering the rapid pace of change in open source technology. Professionals holding valid credentials are more likely to be familiar with the latest technological advances, helping ensure organizations have the skills needed to manage change efficiently and effectively.

When explicitly asked how COVID-19 has affected hiring plans this year, 52% of hiring managers stated they hired fewer open source professionals last year than expected due to the pandemic; this is unsurprising as millions of individuals lost jobs around the world during this time. Interestingly, 38% said they had to increase open source hiring due to the pandemic, which likely has to do with many organizations accelerating digital transformation activities, including cloud migrations, due to the effects of lockdowns.

Figure 1

Percentage of Employers Prioritizing Hiring of Certified Professionals

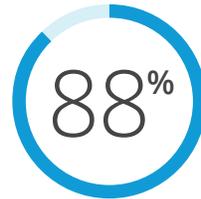


Source: 2021 Open Source Jobs Report

COVID-19 slowed hiring even though skills in open source continue to be in high demand among employers



of hiring managers **plan to increase their hiring of open source professionals** in the next six months compared to the last six months



of hiring managers **stated that hiring certified professionals is a priority**, up significantly from 57% in 2020

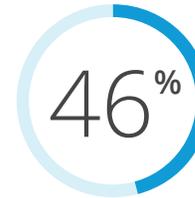


of hiring managers **say hiring open source talent is a priority** for 2021, and they are more likely than ever to look for open source professionals who hold certifications



2021's Hottest Skill Sets

Developers, keep your resumes competitive! Here are the top skills in demand by hiring managers and developers across the globe:



cloud and container technologies



Linux development and administration



networking technologies



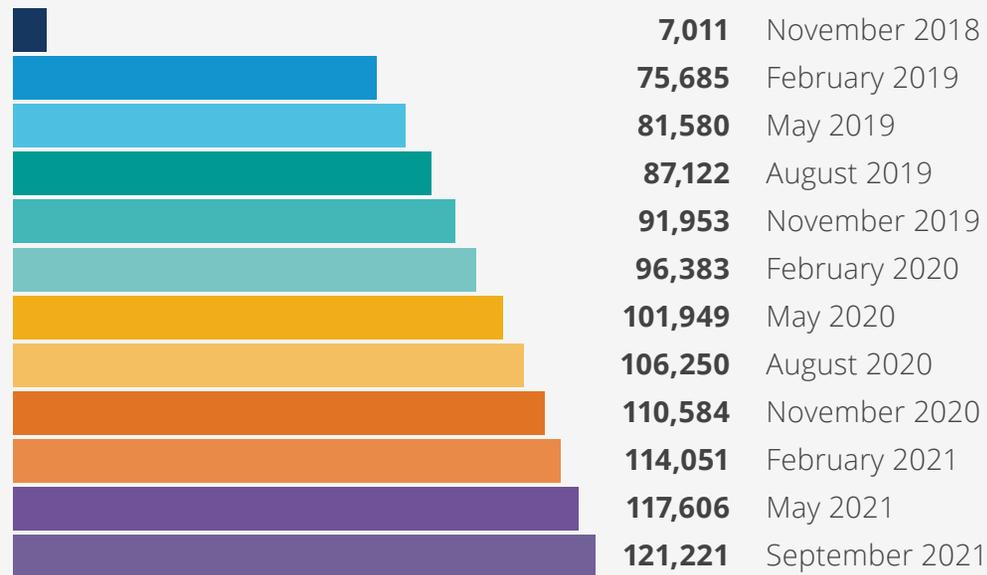
DevOps practices



security practices

Figure 2

Contributor Strength of Kubernetes Project, 2018-2021



Source: LFX Insights

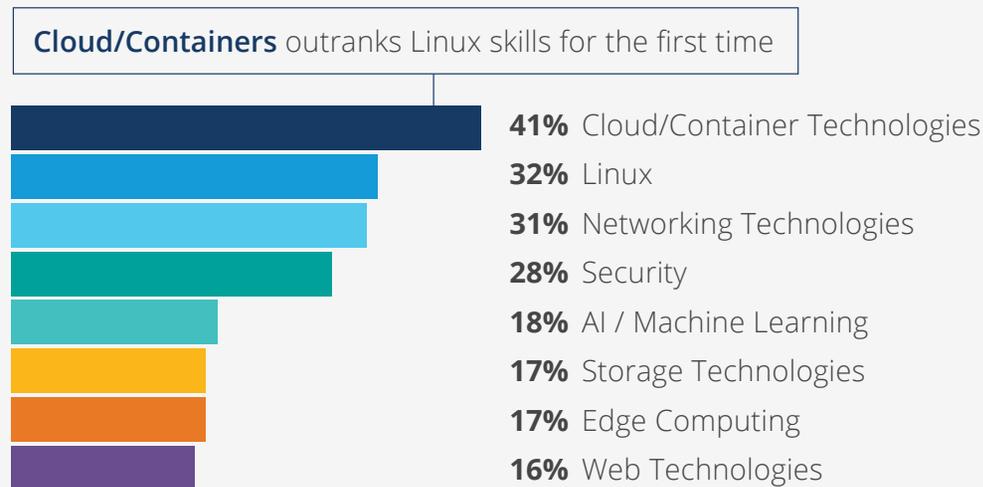
While cloud-native technologies surpassed Linux for the first time in the history of the Jobs Report, it should be noted that it is essential to have at least basic Linux skills to deploy and maintain a robust cloud infrastructure adequately. It is also likely that fluency in Linux skills (as open source *lingua franca*) may be implied for many hiring managers when looking for cloud talent.

The growth in demand for cloud-native skills aligns with what the Linux Foundation Training & Certification program has experienced. Four times as many individuals sat for Kubernetes certification exams in the first half of 2020 compared to 2019. In addition, in the first half of 2021 that number increased another 43%, meaning from the first half of 2019 to 2021 there was a 455% increase in demand for Kubernetes certification.

This is also consistent with the steady increase of developers contributing to Kubernetes, with a 88% growth in contributor strength in the last three years as reflected in Figure 2. In just the past year, Kubernetes has seen significant community interest as well, with more than 148,000 mentions on social media channels.

Figure 3

Technologies of Highest Importance to Open Source Hiring Managers in 2021



Source: 2021 Open Source Jobs Report

The Hiring Manager Point of View

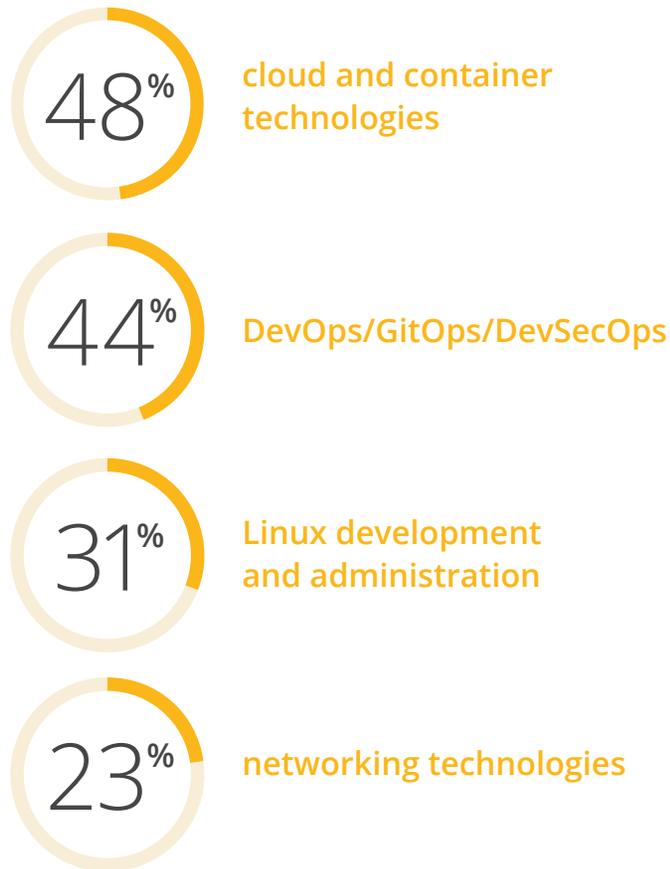
Having teams of top talent has long been a differentiating factor in achieving competitive advantage. So what is on the hiring manager's priority list in 2021? Open source pros agree: they rate cloud and containers overwhelmingly as the most important skill today, with 48% of professionals saying it is in high demand. As outlined in Figure 3, the knowledge domains with the most significant impact on hiring decisions also reinforce the shift to the cloud, with 41% of hiring managers reporting that open cloud technologies have the most significant impact on such decisions. Linux is second at 32%, followed closely by networking at 31% and security at 28%.

Cloud adoption spiked due to the pandemic, with Microsoft reporting they saw "2 years of digital transformation in 2 months"² from customers, so this shifting was to be expected. The 61% of professionals surveyed also reported that their organizations' use of the cloud has increased over the past year. The cloud depends heavily on infrastructure technologies, including Linux and networking. DevOps and security practices are also integrated into the management of cloud environments, explaining the importance hiring managers placed on those areas as well.

2 <https://www.microsoft.com/en-us/microsoft-365/blog/2020/04/30/2-years-digital-transformation-2-months/>

The Professional Point of View

Open source professionals clearly agree with their employers about the importance of cloud and the technologies supporting it. Here are the top skills needed as ranked by developers in today's jobs market:



A majority of professionals (88%) report using DevOps practices in their work today, compared to 75% last year and 58% in 2018. The more than 50% increase in DevOps usage in three years indicates that the industry continues to move beyond quarterly release cycles to continuous deployment.

As DevOps practices are widely used in cloud deployments, this finding also implies that the cloud is not only here to stay, but it has not yet reached its peak. While we are firmly in the phase of technology adoption where most organizations are operating at least partly in the cloud, there are still laggards both in moving to the cloud in the first place and transitioning all parts of the business to the cloud. The skills gap will continue to grow unless more professionals are trained with the skills needed to manage a cloud deployment.

The Linux Foundation Perspective

We are facing a situation where new technologies are being built on legacy technologies, requiring middleware that often cannot keep up with changes in underlying software infrastructure. When combined with a lack of skills around both old and new technologies, the hiring market for open source talent is experiencing unprecedented stress. There are no easy solutions to these challenges, and it will take years to work through all the legacy applications that still exist.

From the perspective of open source professionals, whether grizzled veterans or complete newbies looking to start a career, these software lifecycle and enterprise systems management issues can seem daunting. Modern technology changes so quickly that it is confusing to begin and focus on the right areas to succeed in their professions.

Getting the job done will require organizations to adopt a talent management strategy that uses an all-encompassing mix of upskilling, cross-training, smart hiring, and effective retention programs. All of this work must be planned for and undertaken with an eye towards time, budget, and availability of technical skills.



of hiring managers say that **candidates with experience in open cloud technologies have the biggest impact** on hiring decisions



of professionals say that their organizations' **use of the cloud has increased** over the past year



of professionals report **using DevOps practices** in their work today



Talent Acquisition & Retention

COVID-19 has changed how companies retain talent, and in short, talent follows the money. For the first time in this report, financial incentives are the most common means of keeping talent from leaving, with 39% of companies giving open source talent more salary increases than other business areas. Additionally, 38% have increased bonuses for open source staff, with 25% offering training or certification opportunities as an incentive. Training is essential as 36% of hiring managers reported difficulties in retaining open source staff, which has led to more positions to backfill; this is up from 26% last year and only 21% in 2018, a 71% increase in three years, which implies a widening skills gap and talent shortage.

Per Figure 4, only 2% of employers say they have had no difficulty retaining open source professionals this year, which is a decrease from the 15% who had an easy time retaining staff last year and 21% in 2018. This overwhelming admission implies that talent shortages may become more acute if companies cannot find a way to improve retention.

The Hiring Manager Point of View



92% of hiring managers report difficulty finding sufficient talent with open source skills

Tactics for dealing with shortages of open source talent continue to evolve. A firm majority of hiring managers (58%) state they are increasing training for existing employees to close the skills gap. This training increase is similar to the 57% who said this in 2020 and up from 42% in 2018. In 2018, the most common response to this question was to simply continue looking until the right applicant came along, a tactic that was used by 50% of employers.

Figure 4

Employers Reporting Difficulty Retaining Open Source Staff



Source: 2021 Open Source Jobs Report

The practice of delaying a hire until the right candidate emerged dropped from 50% in 2018 to 43% in 2020 and only 22% this year. The decrease in delay tactics implies that employers have either realized the exact “right” person is not out there or that they simply cannot afford to wait and must consider alternatives to close the skills gap. Interestingly, the second most common tactic to address talent shortages is delaying new technology projects or implementations, which 34% reported doing. This phenomenon may reflect the true price to organizations of the continuing skills gap as they are forced to delay projects which can have significant financial and operational repercussions.



The Professional Point of View

Interestingly, open source professionals report being headhunted more in 2021 than during the past several years, with 55% of professionals receiving more outreach in the past six months than the prior six months. During the pandemic in 2020, only 29% reported receiving more outreach, while 21% heard from recruiters less often. Only 10% of respondents this year stated the volume of recruiter outreach has decreased for them.

This year, more professionals than ever reported that it would be easy to find a new job if they wanted to at 66%. In 2020, only 41% said they could easily find a different role, reflecting the effects of the pandemic. Pre-pandemic in 2018, 55% thought it would be easy; the 20% increase today compared to before the pandemic implies the market right now is very strong, coming off a pandemic slump. This perception of professional skills value and ease of mobility reinforces that employers must redouble efforts to hold onto staff and find new hires.

To do so, employers should pay attention to what these professionals want; the top desired incentive that would prompt a professional to move jobs is increased salary (48% reported wanting this), followed by more training opportunities (35%), increased bonus opportunities (34%), and flexible work arrangements (33%).



Changes to Culture

Nearly 70% of hiring managers surveyed stated that their organization would maintain at least a part-time work from home policy permanently, where not all workers will be required to be in the office every day. In addition, 16% have permanently reduced work travel to some extent. Another ongoing change is the 22% reporting that their companies will only be allowing fully vaccinated workers to return to the office. We anticipate some of these changes will moderate in future years as the pandemic wanes, but others will contribute to a new normal of workplaces.

Regarding COVID-19's effect on workers, 30% report that they experienced an increase in workload due to the pandemic. Other impacts include the 22% who were forced at some point to reduce their hours, take unpaid leave, or lost their job (16% of those who lost a job report they have not yet found a new one). Only 21% stated that the pandemic did not affect their work.

Open source developers specifically were asked in the survey what their employers could do to make them more successful in their roles. The top request is for employers to sponsor training opportunities at 66%, followed by attending technical conferences and events

at 54%. For the first time in the history of this research, attendance at industry events and conferences have not been top in this survey, which anecdotally has to do with the COVID-19 pandemic making it difficult or impossible to travel. Additionally, 45% would appreciate the ability to set aside work time to contribute to open source projects, demonstrating that employers need to enable their teams to work on projects they are passionate about to keep them engaged.

The biggest challenge developers face in the survey, cited by 41% of those surveyed, is a lack of training opportunities (down from 54% last year). Other significant challenges for developers include a lack of documentation for open source projects (38%) and difficulty obtaining buy-in from management to use open source (37%).

While 2020 saw a significant increase in developers saying they face challenges from siloed departments (36%), this has dropped to be the least pressing challenge reported in 2021 at 16%. The 2020 spike likely had to do with COVID-19 making it difficult to communicate between departments. This issue has presumably improved as businesses have adapted to remote work and returned to the workplace.

A woman and a man are sitting at a wooden table in a meeting. The woman is on the left, smiling and looking towards the man. The man is on the right, looking at a laptop. There are papers, a blue mug, and a laptop on the table. A white text box is overlaid on the image.

We are seeing a continued emphasis on using self-paced eLearning, followed by certification, to upskill and cross-train existing teams for the cloud-native journey

The Linux Foundation Perspective

COVID-19 has led to some permanent changes in open source workplaces, and rightly so. In the war for talent, it is time to look closely at employee satisfaction and the impact of non-monetary factors in creating rewarding professional experiences.

Organizations will need to adopt an all-encompassing approach to talent development and retention. Over the past 12 months, we have seen a more than doubling of enrollments in Linux Foundation eLearning courses.

We are seeing a continued emphasis on using self-paced eLearning, followed by certification, to upskill and cross-train existing teams for the cloud-native journey.

Employers should consider providing their technical staff with open source training opportunities and not forget about management and other business functions like finance and legal. As open source adoption continues to accelerate, all parts of the business need to buy in for implementations to be successful and reduce risk around complying with open source licensing and intellectual property.

 **KEY TAKEAWAY**

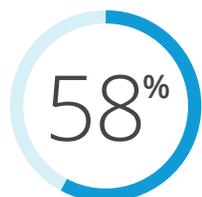
Acquiring and retaining qualified professionals takes priority almost two years into the COVID-19 pandemic



of hiring managers **report difficulty finding sufficient talent** with open source skills



of companies **have given open source talent more salary increases** than other business areas



of hiring managers **state they are increasing training** for existing employees to close the skills gap



of developers surveyed **report employer-sponsored training opportunities as being the most sought benefit** to help them succeed in their roles, followed by attending technical conferences and events at 54%



Training & Certification

Outsourcing or sponsoring training programs have become essential to helping employers meet skills requirements when they cannot find new talent and serves as an incentive for retention. Most hiring managers (58%) report that they have trained existing staff in new technologies to close the talent gap, similar to 57% in 2020. Training of existing staff has a higher priority than other alternatives reported in 2021, including delaying new projects (34%) and hiring consultants (29%).

Interestingly, hiring consultants dropped after a spike in 2020, when 48% of companies were going that route. A decreased emphasis on hiring contract personnel was likely due to increased rates of digital transformation

during the pandemic requiring outside assistance to keep businesses moving as they were forced to adapt to new work styles and increasing cloud usage.

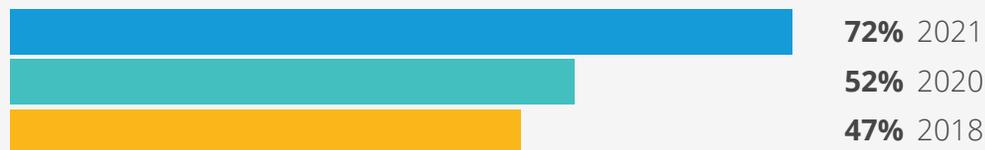
The Hiring Manager Point of View



of hiring managers are **more likely to hire someone with a certification**

Figure 5

Employers More Likely to Hire a Candidate Holding a Certification



Source: 2021 Open Source Jobs Report

As seen in Figure 5, the more than 50% growth in the desire for certified talent over the past few years is leading companies to sponsor their employees' certification efforts. Eighty-eight percent of hiring managers report a willingness to pay for certifications, up significantly from 74% last year and 55% in 2018, a 60% increase in three years.

Certifications help for recruiting purposes, but they are also a retention mechanism. In many cases, they can also make a company more competitive if it can tout a high number of certified IT professionals to its customers. The real-world experience reinforces this finding; the rate of bulk purchases of Linux Foundation

exams by corporate clients is up more than five times in 2021 compared to 2019. It is not only survey results; companies are letting their wallets do the talking.

More hiring managers report seeing increased requests for training in the past year than ever, with 92% reporting this in 2021 compared to 70% in 2020 and 64% in 2018. This 44% increase over three years could have to do with teams looking at ways to learn new skills to cope with pandemic-induced changes to the business and increasing rates of digital transformation leading to skills gaps.

When selecting open source training providers, companies are looking for vendor neutrality. More than three-quarters (77%) state that a training provider for open source tech must be vendor-neutral, identical to the results in the last two iterations of this report. With vendor lock-in always a concern, companies recognize that they need IT talent who understand the core of the technology, not only one iteration of it.



The Professional Point of View

The 60% increase in hiring manager's willingness to pay for certifications over the last four years may be partly driven by the employees who increasingly see the value in certifications: 79% report planning to take a certification exam this year, up significantly from 68% last year and 47% in 2018. The 68% increase over three years may also be driven by the pandemic encouraging individuals to improve their resumes to make themselves more employable in difficult economic times. Almost half of hiring managers (48%) stated that certifications enable them to prove their technical skills to employers, the highest reason reported in the survey.

Developers who responded to the survey also said the main thing their employer could do to help them be more successful is to provide additional training opportunities, with 66% of developers selecting this option. Technology is advancing rapidly, and these developers know they need to keep their skills sharp to be employable and as effective as possible in their job roles.

Open source professionals report they get most of their professional development via free resources, including free online webinars, tutorials, and written materials, with 56% taking advantage of these resources and 46% taking online training courses. The numbers attending conferences, meetups, or other events have dropped from about 50% to 30% in the past year, reflecting changing travel policies due to the COVID-19 pandemic. This decline in live events makes training even more essential as many professionals have traditionally used conferences as continuing education opportunities.

KEY TAKEAWAY

Employees want training, and certifications have become essential, as hiring managers seek to fill roles with qualified pros and improve retention



of hiring managers **are more likely to hire** someone with a certification



of hiring managers **report a willingness to pay** for certifications



of hiring managers **report seeing an increase in requests for training** in the past year

The Linux Foundation Perspective

There are significant areas of overlap between employers and professionals, such as the growing importance of certifications—particularly performance-based ones. Certifications serve as a way for employers to verify skills, which can be difficult when dealing with new technologies. There are few with verified experience and fewer still who are capable of interviewing candidates with confidence. These certifications also act as a way for professionals to demonstrate their prowess and increase their marketability.

Certified professionals are more likely to be up to date on the latest technologies, which is essential in this time of rapid technological change, and almost certainly is driving some of this increased demand for certifications.

Another data point supporting this comes from the Linux Foundation's Training and Certification catalog usage patterns. Since the fourth quarter of 2019, the monthly run rate of certification exams delivered by The Linux Foundation has more than tripled and continues to grow. In addition to a tripling of exam volumes, we see candidates schedule their exams much closer to the point of purchase. In contrast, the pattern used to be to wait until prompted by their 90-day expiration notice.

The Value of Open Source Contribution

Companies are leaning into the importance of specific open source projects and recruiting individuals who have been involved with them. This desire to increase employment of in-house FOSS project contributors is at least partly due to increased adoption of open source generally, in addition to more organizations gaining a better understanding of how to work with the open source community.

The Hiring Manager Point of View

Interest in staff who have experience contributing to open source projects increased this year; 44% of hiring managers stated this to be the most important technical skill or experience when looking for new team members, higher than any other.



of hiring managers are **looking for individuals with expertise architecting solutions based on open source software**

The overwhelming majority of hiring managers surveyed (93%) also stated that their organization has contributed to open source in some way—such as donating code or funding—to recruit individuals who work on those open source projects to work for them, an almost 50% increase from 2020 (63%). By comparison, open source contributions were nearly double the 48% reported in 2018. This increase in organizational open source participation reflects the increased adoption of open source across the board, mainly driven by an acceleration of digital transformation activities due to the COVID-19 pandemic. Organizations scramble to implement new technology solutions. They find the most effective and efficient way to do so is through open source, which requires staffing up their teams with open source experience and connections in the open source community.

The Professional Point of View

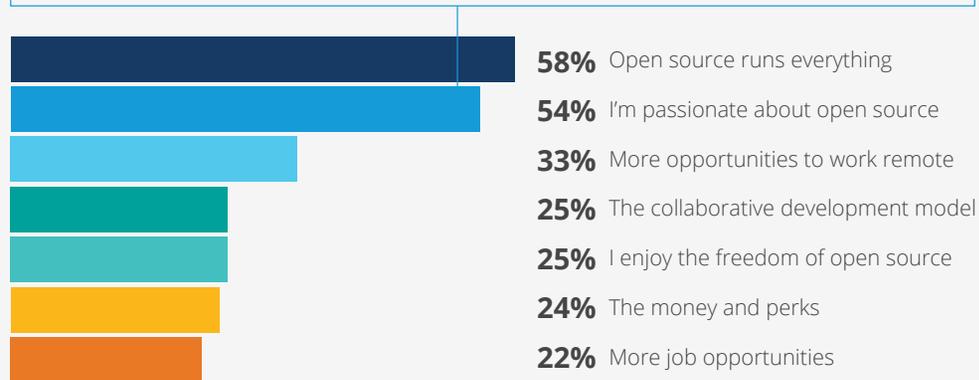
Open source professionals share similarities with the hiring managers here. The ability to architect solutions based on open source software ranked as the most valuable skill with 50%, with experience contributing to an open source project close behind at 48%. The ability

Direct contributions and involvement in open source projects have tangible value to both employers and IT professionals

Figure 6

Why Professionals Choose a Career in Open Source

54% of professionals **started their open source career because they are passionate** about open source, demonstrating this work is more than just a job to them



Source: 2021 Open Source Jobs Report

to deploy open source software was also third for professionals, with 40% stating this as an essential skill.

As shown in Figure 6, the top reason professionals report that they pursued an open source career continues to be that open source runs modern technology and that working in the field makes them more employable at 58%. This trust in open source technology, its recognition of widespread use in the industry, and perceived professional value slightly edges out being passionate about open source, reported by 54% of respondents.

Money and perks again this year are not reported as a top reason for pursuing an open source career, with only 24% of respondents selecting this. However, that is an 85% increase from the 13% reported in both 2018 and 2020. This increase may be evidence of open source being seen as a more lucrative technology area as it has become dominant. However, it could also have to do with the pandemic forcing other changes to work practices, such as enabling more remote work and flexible hours. If most jobs are going to be flexible on work locations and times anyway, compensation becomes more of a differentiator.

A plurality of these professionals reports the best part of their job is a collaboration with a global community, with 23% of respondents selecting this option, demonstrating that open source truly is a community-focused career.



of hiring managers surveyed **want staff who have contributed previously to open source projects**, higher than any other type of experience they seek



of professionals **ranked the ability to architect solutions based on open source software as the most valuable skill**, with experience contributing to an open source project close behind at 48%



of professionals report that they **work in open source because it runs modern technology** and that working in the field makes them more employable

The Linux Foundation Perspective

Often, internal developers contribute and maintain code in open source software projects on behalf of their employers and sometimes as a hobby project. In terms of career development and earned social reputation, developers' attraction to work on open source projects is so compelling that their organizations may be losing developers to competitors who more aggressively leverage open source software.

Further, companies that allow and encourage developers to participate in the open source software community during business hours tend to recruit and retain the

brightest talent, even in a tight labor market such as we are now experiencing. Employers would benefit from keeping in mind what these professionals view as their priorities. Giving teams time to collaborate with open source communities outside of their specific workplace is not only good for morale, it also gives them insight into and knowledge of open source projects which may be useful in their day-to-day work.

Adoption of open source programs and initiatives are widespread and have gone beyond early adopters. Additionally, many organizations are well past the stage where they want to be strictly consumers of open source software; they are ready to be participants in the actual development process of the software and tools they are using. This adoption includes running [Open Source Program Offices \(OSPOs\)](#) to align efforts across their organizations under a management system and policies designed to create a positive experience for internal developers and external participants, as well as for the communities in which they actively participate.

Diversity, Equity and Inclusion

As with previous years in which we released this report, there is no getting around the perception gap between what employers think they are doing and what their employees see them doing. This gap strongly indicates that there may be performative allyship by companies who are “talking the talk” but not entirely “walking the walk” regarding diversity.

Some Progress is Visible

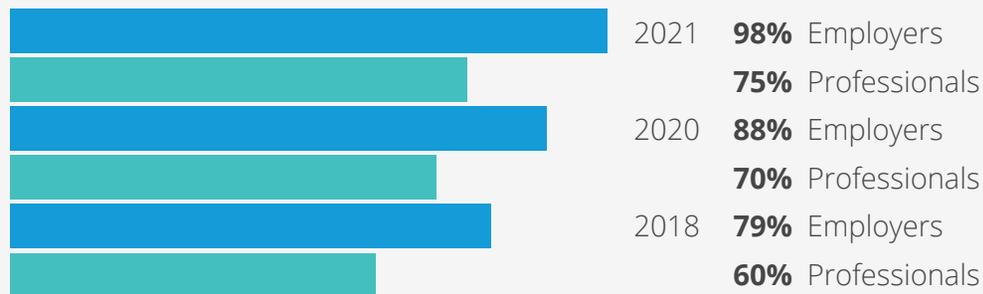
As shown in Figure 7, virtually all employers surveyed (98%) state that their company proactively encourages diversity in hiring, up from 88% last year and 79% three years ago. The increase in diversity hiring compares to only 76% of employees who feel their companies are making an effort to hire a more diverse workforce—a notable 27% increase since 2018; even with this growth, a perception gap persists with employers believing they are doing more to encourage diversity than their rank-and-file staff sees happening.

Across-the-board increases in diversity, equity, and inclusion practices are positive developments, and likely due at least in part to the increased visibility of issues raised by movements like Black Lives Matter and the LGBTQ+ community.

This year, over a third (36%) of companies report offering diversity training, and 22% report sponsoring diversity groups within their organizations. These numbers do not differ significantly from what open source professionals report as the efforts they have seen at their own companies.

Figure 7

Employers vs. Professionals Saying Their Company Proactively Encourages Diversity in Hiring



Source: 2021 Open Source Jobs Report



KEY TAKEAWAY

Diversity in hiring and inclusivity practices have become much more important within organizations, but gaps between employers and employees raise questions about the true extent of efforts



of employers **state that their company proactively encourages diversity in hiring**; this compares to 75% of employees who feel their companies are making this effort



of companies **report offering diversity training**, and 22% also report sponsoring diversity groups within their organizations



of open source professionals **report that they have been discriminated against** or felt unwelcome due to their personal characteristics, up from 11% in 2020 and 8% in 2018

More Progress is Needed

The perception gap persists when asked to rate the effectiveness of diversity efforts within one's organization. Most hiring managers (87%) rate their diversity efforts as Excellent or Good—an increase of 28% over 2020. By comparison, 78% of employees rate their diversity efforts as Excellent or Good—a 34% increase over 2020. Despite the persistent gap in perception between employees and employers, year over year growth indicates that progress is being made.

Supporting industry-wide groups and initiatives such as Women Who Code or Blacks in Technology remain the most common DEI activity, reported by 52% of companies; the growth rate over last year's report was insignificant.

Companies that actively recruit under-represented individuals have decreased to 41% in 2021—a decline of 21% from last year's report. This decline implies that while hiring managers report that they have become more likely to encourage diversity in the hiring process, fewer of them are going out and looking for under-represented individuals and encouraging them to apply. Changing this trend will be essential to achieving equity of opportunity in the open source industry.

The least welcome news in this DEI analysis was that 18% of open source professionals report that they have been discriminated against or felt unwelcome due to their personal characteristics—a 125% increase over the 2018 findings. Reports of discriminatory activity or exclusion having more than doubled in three years could be related to increased awareness

and willingness for individuals to speak out, or it could be partly driven by a backlash against movements to advance equality in marginalized communities. To continue positive progress, the industry must take concrete steps to increase diversity and become more welcoming to all.

Conclusion

The 2021 Jobs Report demonstrates that we are in a year of recovery and rebound for the technology industry. Opportunities to network and engage in business development come with tepid feelings around return to in-person work, meetings, and events. Still, changes are afoot as desired skill sets for enterprises and hiring managers to shift to cloud, containers, and orchestration systems, as well as DevOps practices—all of which are powered by open source software.

It is time for professionals to skill up by taking advantage of training courses and taking certification exams to prove their proficiencies in these technologies. The data in this year's report demonstrates that their careers depend on it more than ever.

For enterprises, it means that they now need to be more responsive to training and certification requests from their staff—because competing firms are aggressive about making training, hiring, and retention a priority.

Hiring managers are discovering that skilled professionals are in high demand. Finding the right people to fill roles with the skills necessary to succeed in their job functions may mean training the seasoned pros they already have. Training also provides a signal to organizations' existing staff that they are worth the investment, translating into the retention of those employees, ideally for years to come.

Finally, when it comes to organizational and ecosystem-wide diversity, be sure to engage in progressive hiring practices and make sure your workplaces and work environments are inclusive. Executing on this vision means actively hiring underrepresented individuals and making an effort to ensure these groups apply to positions in your organization. Be sure to foster inclusivity efforts to make your workplace a positive one for every individual, regardless of personal characteristics.



Methodology

From June 8 to July 19, 2021, edX and The Linux Foundation surveyed hiring managers and open source professionals about their job needs and preferences. Hiring managers from corporations, small and medium businesses (SMBs), government organizations, and staffing agencies were surveyed. More than 200 responded with 47% indicating their company was headquartered in North America, 14% in Asia (outside of China, India, and Japan), 8% in China, 7% in Europe, 6% in Africa, 6% in Australia/New Zealand, 5% in India, 2% in Mexico and Central America, 2% in Japan, 1% in South America, 1% in the Middle East and less than 1% each in other regions. Respondents needed to have hired at least one open source professional in the last year or have plans to hire open source professionals in 2021 to participate in the survey. In addition, more than 750 open source professionals responded to the survey, with 75 percent indicating they have been working as an open source professional for three years or more.

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The Linux Foundation promotes, protects, and standardizes Linux by providing unified resources and services needed for open source to compete with closed platforms successfully and provides a neutral, trusted hub for developers to code, manage, and scale open technology projects.



edX is the trusted platform for education and learning. Founded by Harvard and MIT, edX is home to more than 40 million learners, the majority of top-ranked universities globally, and industry-leading companies. edX is transforming traditional education, removing cost, location, and access barriers.



Linux Foundation Research explores the growing scale of open source collaboration, providing insight into emerging technology trends, best practices, and the global impact of open source projects.



The Linux Foundation's training program features [courses](#) developed and taught by expert instructors, many of whom are well-respected developers in the open source community. Our [certification](#) team performs comprehensive industry and job analyses to ensure every professional certification program we offer meets our exceedingly high standards. Combined with our outstanding customer success team, we can deliver responsive [support](#) and customized [training solutions](#) to enable individuals and businesses to succeed.



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