STATE OF CLOUD NATIVE DEVELOPMENT Q3 2025

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CLOUD NATIVE COMPUTING FOUNDATION

OCTOBER 2025

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KEY INSIGHTS

- Approximately 56% of backend developers are cloud native, as of Q3 2025. →
- Cumulatively, there are 15.6M cloud native developers, of which 9.3M are backend developers. →
- 41% of professional ML/AI developers are cloud native, as of Q3 2025. →
- Hybrid and multi-cloud deployments are continuing to increase in popularity, used by 30% and 23% of developers, respectively. →
- Backend developers reach a stable proportional adoption of cloud deployment configurations sooner than the general population, suggesting earlier adoption and saturation among these developers. →
- API gateways are used by 50% of backend developers, and 46% are operating microservices. →
- Immutable infrastructure practices and chaos engineering are desirable practices for creating stable and reliable services, but are only practiced by 7% and 6% of backend developers, respectively. →
- 77% of backend developers are using at least one technology strongly associated with cloud native approaches. →
- The majority of DevOps professionals (58%) are cloud native, while only a minority of game developers are (30%). →
- ML/AI developers may exhibit a lower level of cloud native behavior than expected due to the higher usage of MLaaS, which abstracts the infrastructure and compute demands that would otherwise encourage exploring cloud native practices. →

INTRODUCTION

01

1. Introduction

Cloud deployment has become an integral part of software development, with the vast majority of developers now relying on cloud infrastructure in some capacity. In recent years, a re-evaluation of the *"cloud or bust"* approach has begun, as some organizations instead focus on strategic leveraging of the cloud. During this period, it is important to highlight that, despite the relative ubiquity of cloud deployment, not all developers and organizations are fully utilizing the capabilities of cloud computing through the use of cloud native technologies or approaches.

This report, produced in partnership with the Cloud Native Computing Foundation, presents the latest insights into the state of cloud native developers in Q3 2025. It provides an analysis of key trends shaping the cloud native ecosystem, drawing on data from the 30th edition of SlashData's Developer Nation survey, fielded between June and July 2025, which reached more than 12,000 respondents from 128 countries around the world.

1. Introduction

As the term “cloud native” means different things to different developers, for this report, we define developers as cloud native based on the usage of multiple specific technologies[1], which include containers, container orchestration and management tools, service meshes, Kubernetes, cloud functions or serverless computing, event-driven architecture, observability tools, immutable infrastructure practices, chaos engineering, multicluster management, and streaming and messaging services.

A key focus of this edition of State of Cloud Native is the expanded cloud native community that exists outside of the traditional backend services space. In this report, we provide estimates for the proportion of developers across a wide range of development spaces who are cloud native, and how this may impact the future of the cloud native community and the development of technologies to serve these new developers. In addition, we look at the popularity of different cloud technologies across these divergent development spaces.

Throughout the analysis of the expanded cloud native community, we include additional attention to the machine learning and artificial intelligence community, who are an important group to understand as cloud native technologies seek to meet this moment.

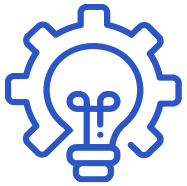
[1] Those involved in backend development are shown more cloud native technologies during the survey. As such, those in backend development must select at least three cloud native technologies, while all other respondents must select at least two.

TRENDS IN CLOUD NATIVE DEVELOPMENT

02

2. Trends in Cloud Native Development

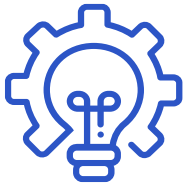
In Q3 2025, 56% of developers involved in backend services are identified as cloud native. This is a large increase from just six months ago — 49% in Q1 2025 — and is also a substantial increase over the last five years. However, this proportion only tells half the story. This substantial increase can be attributed to two different driving factors. The first is that this audience now includes developers in both backend web development and backend services. Secondly, we are able to account for a greater range of implementations of cloud native technologies and approaches. As can be seen in the adoption of technologies later in this report, this has led to a very different technology composition of the cloud native audience.



15.6M

CLOUD NATIVE DEVELOPERS IN Q3 2025

With more developers able to be assessed for their usage of cloud native technologies, we can provide a greater estimate of the wider cloud native community. Based on our data, we estimate that 32% of all developers are cloud native, equating to approximately 15.6M, with around 9.3M of these being involved in the traditional backend space. This represents a small increase from six months ago, when there were 9.2M cloud native backend service developers in Q1 2025, and reflects the growing trend of backend services transitioning from a distinct area of development to becoming just one component of the modern developer's toolkit.

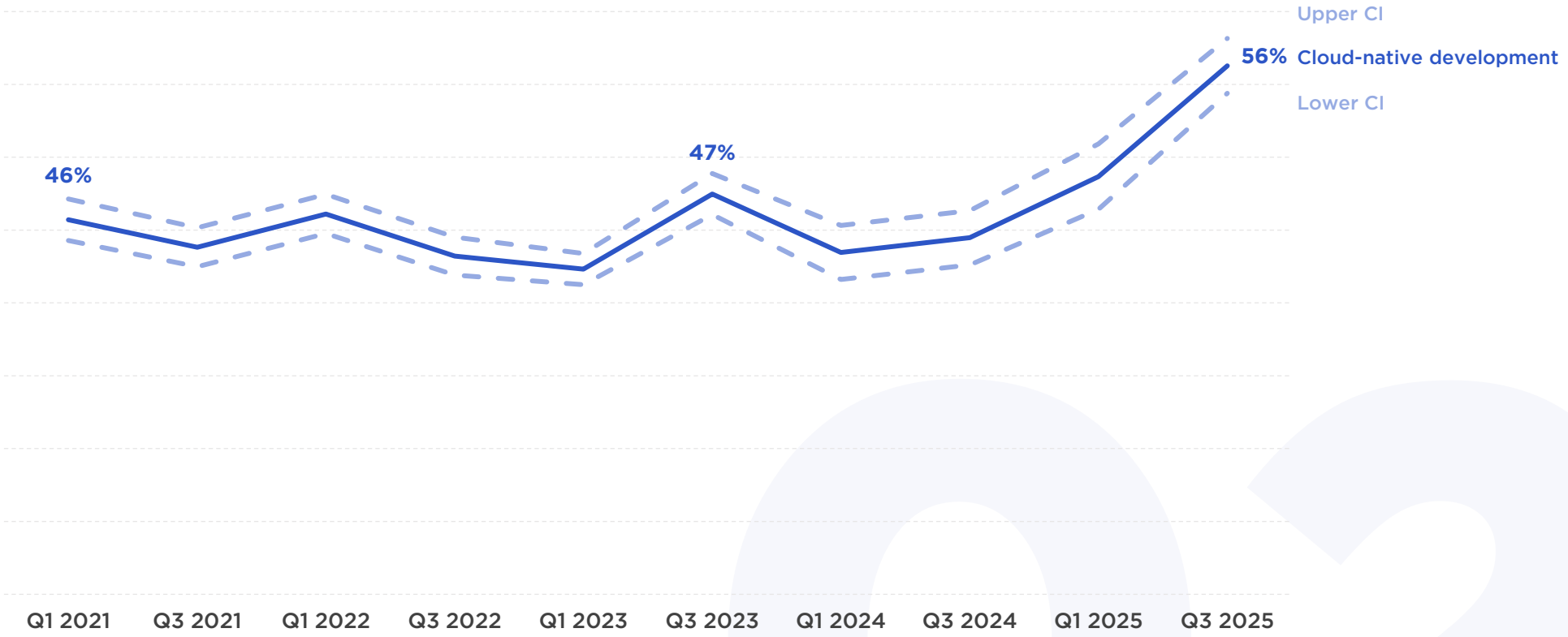


7.1M

ML/AI DEVELOPERS ARE CLOUD NATIVE

In addition to the wider cloud native community, we can also estimate that about 7.1M developers involved in machine learning or artificial intelligence (ML/AI) are cloud native. It is important to note that this number includes developers who are also involved in backend development or other development areas, so this group is composed of cloud native developers counted in the backend space too.

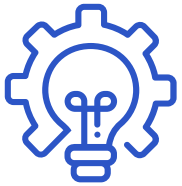
Proportion of Cloud Native Backend Developers



Question wording: Which of the following technologies have you used as part of your backend services development in the last 12 months?
% of backend developers (21Q1 n=4,668 | 21Q3 n=5,260 | 22Q1 n=5,261 | 22Q3 n=5,619 | 23Q1 n=8,182 | 23Q3 n=4,847 | 24Q1 n=2,743 | 24Q3 n=2,754 | 25Q1 n=1,903 | 25Q3 n=2,666)

Trend in cloud deployment

In addition to the trends in cloud native developers, we can also examine how cloud deployment choices have evolved over time. When looking at the entire developer community, we can see that hybrid cloud has shown a strong increase in adoption over the last four years. 22% of developers were deploying to hybrid cloud in Q1 2021, compared to 30% in Q3 2025. As discussed in other research from SlashData, hybrid cloud has been increasing in popularity among certain demographics of organizations. Hybrid cloud offers additional security and compliance benefits that are increasingly attractive or necessary for many organizations, particularly as threat vectors continue to evolve and governmental regulation advances.



30%

OF ALL DEVELOPERS ARE DEPLOYING TO HYBRID CLOUD IN Q3 2025, SHOWING A CONTINUED INCREASE IN POPULARITY

2. Trends in Cloud Native Development

Among those in backend development, the usage of hybrid cloud has been stable at 23% since Q3 2023. This is likely a consequence of those in backend development having already made the shift towards hybrid cloud several years ago, and only now is the impact beginning to trickle out to the wider developer community that relies on the services these developers created.

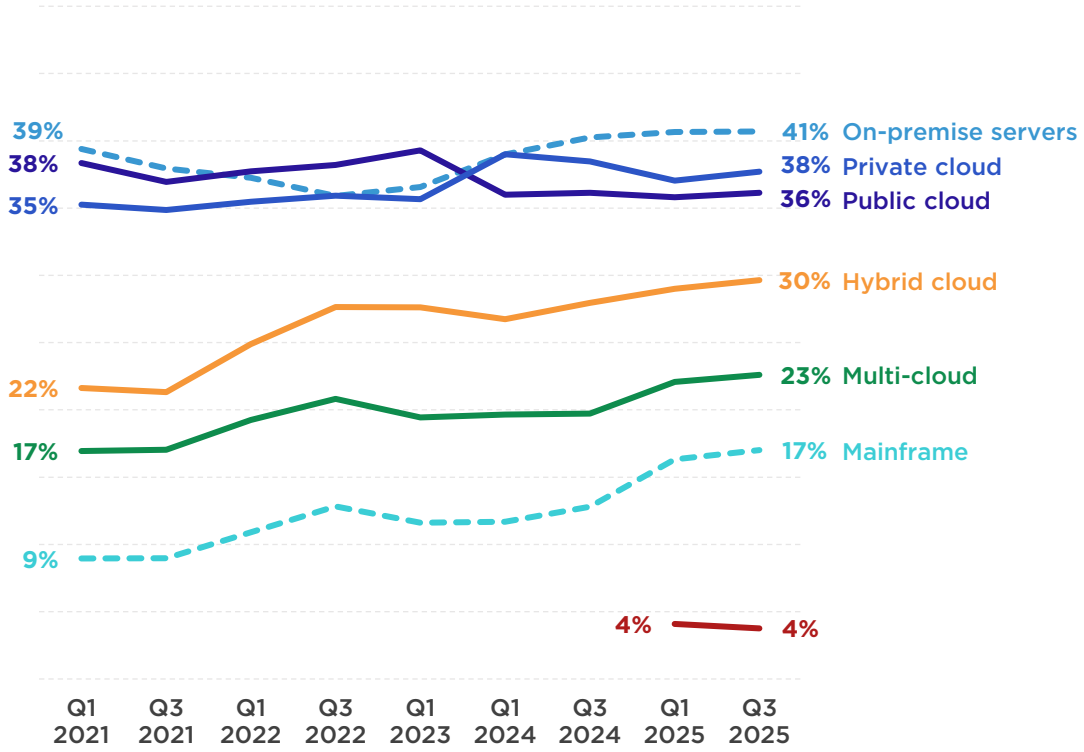
The same relationship can be seen with multi-cloud deployment. Among the general developer community, this approach has increased from 17% of developers in Q1 2021 to 23% in Q3 2025 and has hovered around 15% since Q1 2022 for backend developers. While backend developers may have moved towards this approach at an early stage, their lower levels of adoption are likely a result of having to fully own the infrastructure and operational continuity of these services.

As such, developers with other responsibilities may use multi-cloud approaches to handle their processes when they feel it is useful, while those in backend development have to consider the full scope of integration challenges and requirements and therefore don't adopt this approach at the same scale.

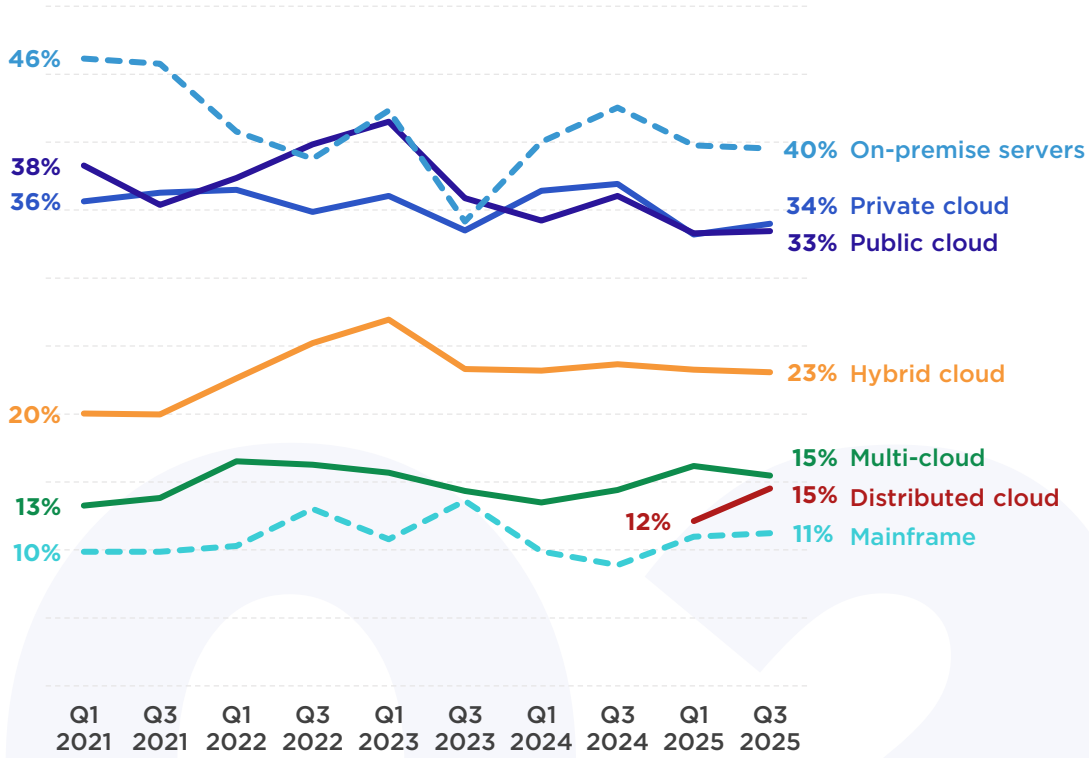
Distributed cloud has increased from 12% in Q1 2025 to 15% in Q3 2025 as the choice of backend developers. If this pattern of early exploration by backend developers before wider adoption by the general developer population continues, we may see distributed cloud start to achieve wider adoption soon.

Trends in cloud deployments

Cloud deployment trend among all developers



Cloud deployment trend among backend developers



Question wording: Which of the following technologies have you used as part of your backend services development in the last 12 months?
% of developers | % of backend developers (21Q1 n=11,177 | 21Q3 n=12,132 | 22Q1 n=13,344 | 22Q3 n=17,820 | 23Q1 n=20,879 | 23Q3 n=10,521 | 24Q1 n=10,521 | 24Q1 n=9,886 | 25Q1 n=10,731 | 25Q3 n=12,021)

Cloud technologies

Cloud native development is not solely about the technologies used; however, tracking the usage of technologies associated with cloud native development provides important context for how the space is evolving. In this section, we look at the adoption of these technologies among backend developers.

The most obvious change is the sharp decline in container usage (52%) after being consistently above 60% since Q3 2020. While the decrease might look like a dramatic and unexpected falloff of containers, experience with the development world makes it clear that this isn't the case. Instead, the decrease is a reflection of the changing definition of backend developers we are seeing.

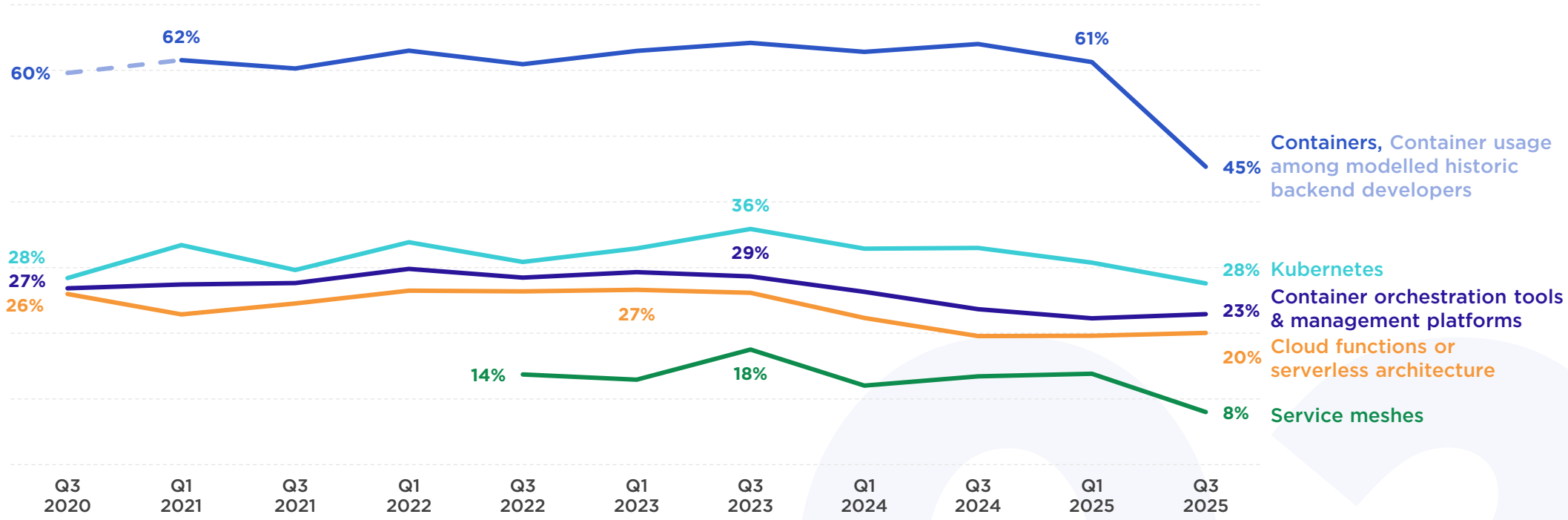
> ***The evolving nature of what a backend developer is has impacted the adoption of containers***

2. Trends in Cloud Native Development

Backend development now includes a sizable proportion of those focused on serving backend web development, who have a greater focus on directly supporting web applications. While they are engaged in cloud native practices and technologies, their technology stack can also lean toward higher-level, web-optimized services that may abstract infrastructure and complexity.

For other technologies, we see a continuation of previous trends. 30% of backend developers use Kubernetes, a decrease from its peak of 36% in Q3 2023. Kubernetes has been on a slow decrease in adoption rates but will likely stabilize at a new lower proportion due to the maturity of the technology. Service meshes have seen a decrease in adoption rates, from a peak in Q3 2023 of 18% to 8% in Q3 2025. These decreases may be a result of the organizational reconsideration of how to approach cloud deployment, as mentioned in the introduction. Service meshes are associated with increasing costs due to higher CPU demands. However, an additional downward pressure may also come from the capabilities of service meshes being integrated into other tools, as well as service meshes moving to the responsibility of platform teams, leading to the technology being abstracted away from developers.

Trends in the adoption of technologies associated with cloud native development

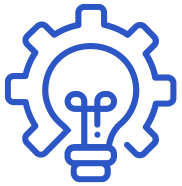


Note: Due to the changing nature of backend service development and its methodological capture within our survey, we include an estimate of the trend for the historical audience. Features of the historic audience were modelled and subsetted from the current audience. This value is intended to be indicative, rather than precise, and to allow the current and former audiences to be understood in combination.

Question wording: Which of the following technologies have you used as part of your backend or cloud services development in the last 12 months?
% of backend developers (21Q1 n=4,668 | 21Q3 n=5,260 | 22Q1 n=5,261 | 22Q3 n=5,619 | 23Q1 n=8,182 | 23Q3 n=4,847 | 24Q1 n=2,743 | 24Q3 n=2,754 | 25Q1 n=1,903 | 25Q3 n=2,666)

Server technologies and approaches

For the last part of this section, focusing on backend development, we dig into greater granularity on the technologies and approaches for their infrastructure. This data also enables us, for the first time, to have a clearer understanding of their relative popularity. Further, it allows us to see how widespread the adoption of cloud native technologies and approaches is, even for developers who may not fully qualify as cloud native based on our stricter definition.



50%

OF BACKEND DEVELOPERS ARE USING API GATEWAYS

API gateways are the most popular technology, used by 50% of backend developers, with microservices being the leading approach, adopted by 46% of backend developers. This reflects the foundational nature of both API gateways and microservices, as they are often either required for other technologies or essential to the functionality of modern service stacks. Notably, while API gateways and microservices are architectural patterns that typically run on Kubernetes infrastructure, only 30% state that they are using Kubernetes.

This suggests that developers may not consider themselves as users of Kubernetes, despite using technology frequently dependent on it. This gap suggests three possible scenarios: some developers use microservices without Kubernetes (via serverless or PaaS alternatives), some benefit from well-abstracted internal platforms that hide Kubernetes complexity, and some may be unaware of their underlying infrastructure. The second scenario reflects platform engineering maturity, as abstracting complexity is generally desirable. However, organizations should ensure sufficient Kubernetes expertise exists somewhere in their teams, as troubleshooting and optimization often require understanding the orchestration layer, even if most application developers are appropriately shielded from it.

2. Trends in Cloud Native Development

IDP usage has risen from 23% in Q3 2024 to 27% in Q3 2025, while the proportion of developers reporting their organization has a dedicated team for improving developer experience (DX) decreased from 44% to 40%, a symmetrical 4 percentage point shift. This pattern could indicate that platform teams have successfully implemented IDPs, shifting their focus from general developer experience improvements to maintaining embedded infrastructure. Alternatively, these could be independent trends[1] for example, organizations removed their DX team and instead adopted vendor-provided or open-source IDPs. Regardless of the underlying cause, the 40% of organizations with dedicated platforms or DX teams represents potential for further IDP growth, assuming these teams prioritize platform engineering initiatives.

After Kubernetes (30%), the next most common technologies and approaches are observability tools (28%), event-driven architecture (27%), and streaming and messaging services (26%). While these are less popular than API gateways and microservices, they constitute sophisticated architectural approaches. This statistic indicates that a sizable portion of the backend community is working with more sophisticated infrastructure approaches.

[1] We currently have longitudinal data over one year but will continue to monitor this trend

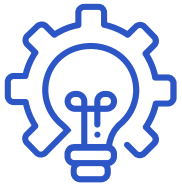
However, specialized practices like immutable infrastructure (7%) and chaos engineering (6%) currently remain limited to specific use cases. These practices offer significant benefits for system reliability and operational efficiency that could benefit a much broader range of developers. The low current adoption rates suggest either an education gap around their value proposition or that current implementations remain too complex to configure and maintain for typical development teams.

Organizations appear to adopt cloud native practices in three stages: foundational, sophisticated, and specialized

2. Trends in Cloud Native Development

One of the most notable findings is that 77% of backend developers are using at least one technology strongly associated with cloud native approaches. This demonstrates the broad proliferation of these technologies even among practitioners who may not explicitly identify as cloud native. The data reveals a likely three-phase adoption pattern: foundational technologies (API gateways, microservices), sophisticated approaches (Kubernetes, observability), and specialized resilience practices (chaos engineering, immutable infrastructure).

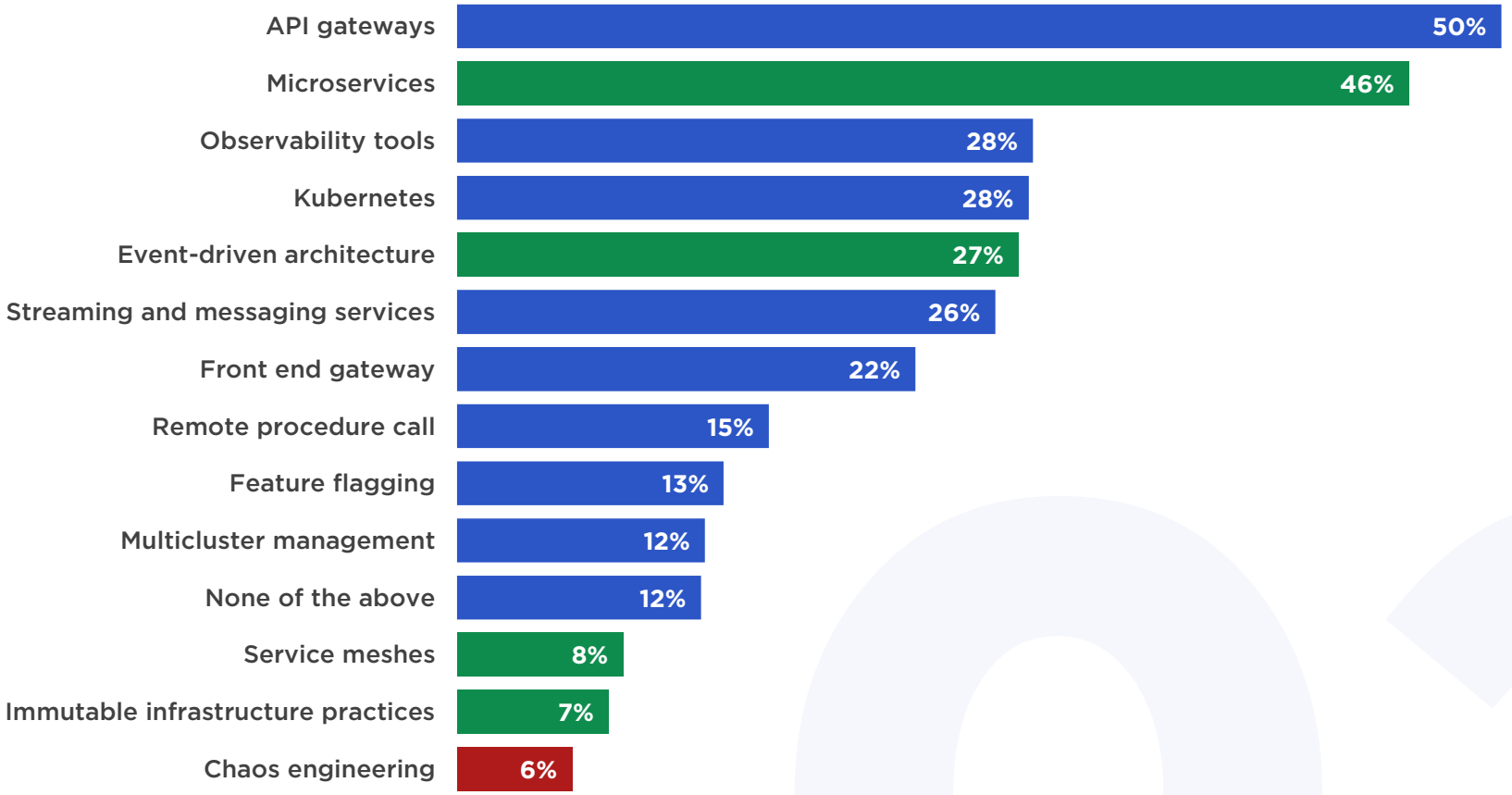
This creates an interesting paradox: while cloud native technologies are widely adopted, there remains substantial headroom for growth in the most mature operational practices that define truly resilient, cloud native systems. Beyond adoption rates, there is a critical need to ensure that as developers embrace these technologies, they also understand the underlying philosophy of cloud native computing to fully leverage its advantages.



77%

OF BACKEND DEVELOPERS ARE USING AT LEAST ONE TECHNOLOGY STRONGLY ASSOCIATED WITH CLOUD NATIVE APPROACHES

Adoption of backend technologies or infrastructure approaches



Question wording: Have you used any of the following infrastructure approaches or technologies in your backend services in the last 12 months? If so, which ones?
% of backend developers (Q3 2025 n=2,790)

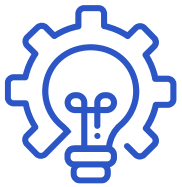
THE “NEW” CLOUD NATIVE COMMUNITY

03

3. The “New” Cloud Native Community

As cloud native technologies and practices proliferate throughout the wider developer space, it is important to quantify the scale of cloud native within different disciplines and areas of software development. Alongside providing an overview of cloud native adoption, it provides crucial context on which areas have been less receptive to cloud native technologies and, as such, places where technology stewards may want to make targeted differences to better meet these developers’ needs.

After those in backend services, professional DevOps developers are the most likely to be cloud native (58%). With their roles focused on providing support to developers by creating processes and infrastructure that increase efficiency, stability, and security, there is a natural fit for these developers to engage with cloud native technologies. When looking at the cloud technologies DevOps professionals are using, we see higher rates of container orchestration (25%), cloud monitoring (30%), and cloud function or serverless computing (25%).



58%

MORE THAN HALF OF DEVOPS PROFESSIONALS CAN BE CLASSIFIED AS CLOUD NATIVE

Games developers show the lowest rates of cloud nativeness, due to a lower reliance on cloud compute in their services

Professional web backend developers have the third-highest proportion of cloud native developers (52%). We also see a higher proportion of web frontend developers who are cloud native (45%), though a major driver of this is the presence of full-stack developers, who are involved in both the front and backend of web development.

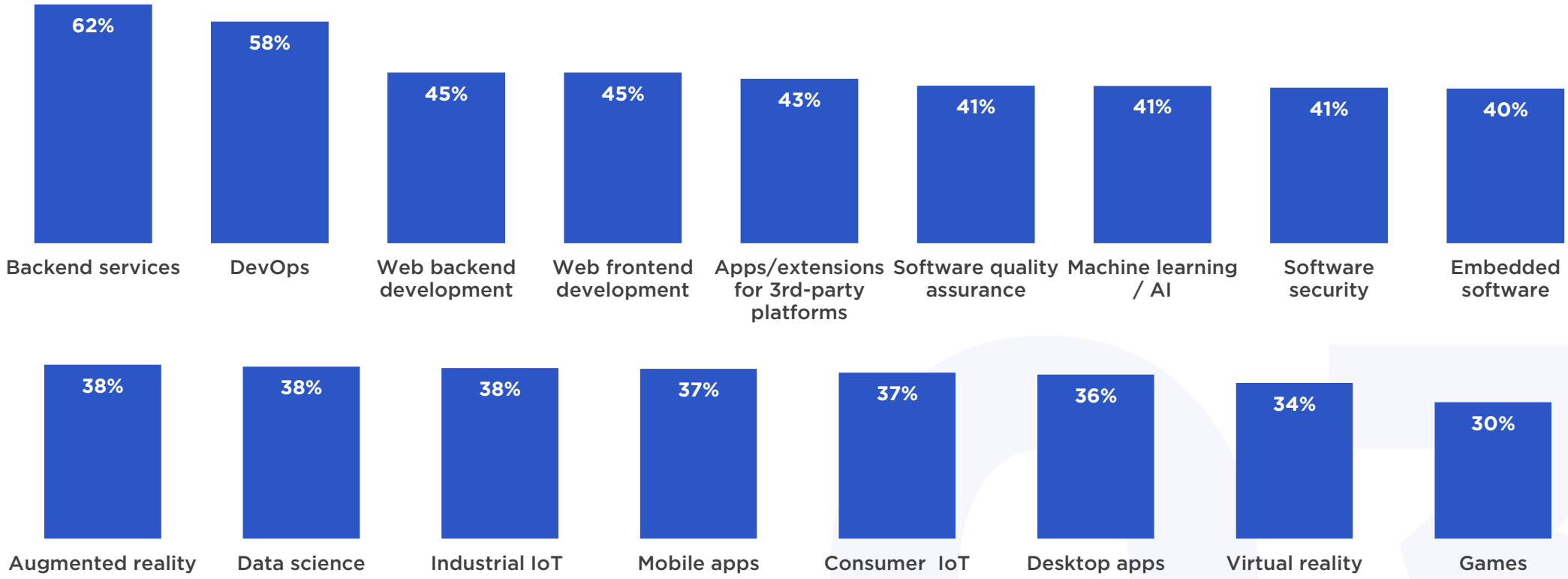
Most other industries form a long plateau, going from those creating third-party extensions (43%) to virtual reality (34%). Games is markedly lower than the rest of the development sector (30%), but this is expected because the games sector has different priorities and focuses on development, where performance routinely does not depend on cloud compute. Further, for games where cloud computing is particularly valuable, this is not a requirement for all roles, allowing developers to be siloed into distinct groups that either do or do not interact with cloud native technologies. This percentage is somewhat different from other industries, where the technologies often proliferate throughout the entire organization.

3. The "New" Cloud Native Community

However, given the focus on ML/AI developers being able to take advantage of cloud native computing in their development, only 41% of professional ML/AI developers being cloud native may seem low. The computational demands of ML/AI workloads, as well as the scalability requirements, make them well-suited to the cloud native philosophy. One explanation for their lower levels of cloud nativeness could be a result of many ML/AI developers having substantially lower involvement in infrastructure management, with 29% using Machine Learning as a Service (MLaaS) platforms. These developers can focus on model development and data science while relying on managed services to handle the scalability and orchestration challenges that would otherwise drive cloud native adoption. In addition, developers who are using MLaaS services that provide access to foundational models to build services have reduced pressures to adopt cloud native practices, as both the compute and delivery are outsourced.

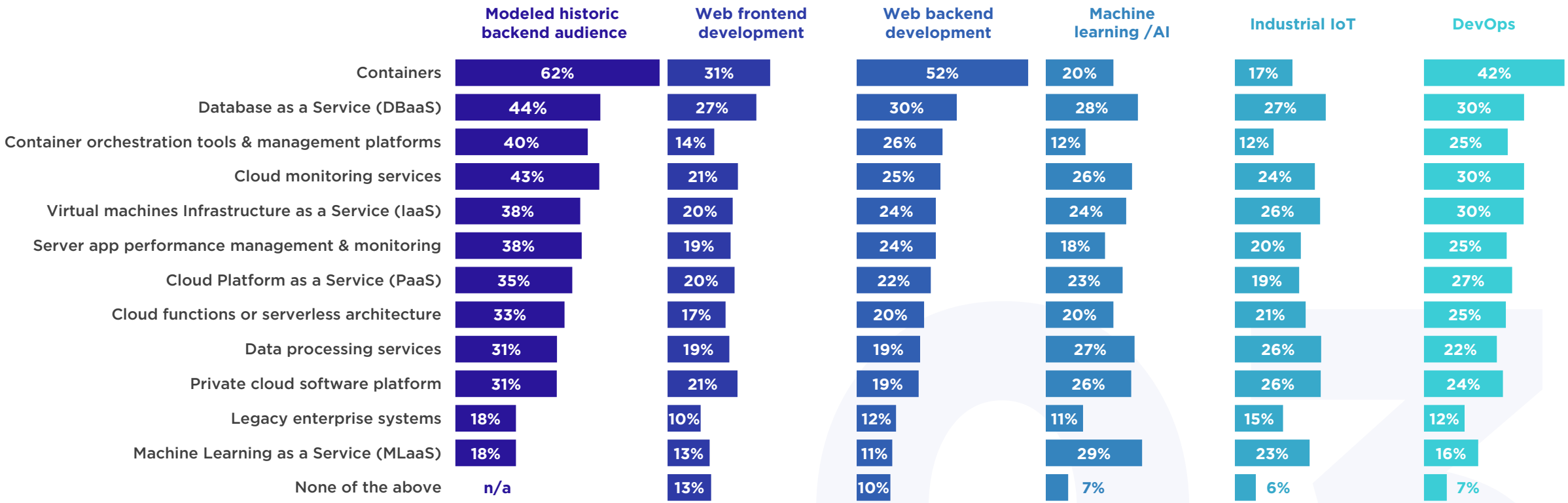
Despite the benefits of cloud native computing for ML/AI developers, only 41% of professionals in this area are cloud native, possibly due to the high usage of MLaaS

Proportion of professional developers in each development area that are cloud native



Question wording: How are you involved in the following types of development or projects? | Which of the following technologies have you used as part of your backend or cloud services development in the last 12 months?
% of professional cloud native developers in each development area (Q3 2025 n=7,778)

Adoption of cloud technologies by developers in different development areas



Question wording: Which of the following types of apps/development projects are you involved in? | Which of the following technologies have you used as part of your backend or cloud services development in the last 12 months?
% of professional developers in each development area (Web backend development n=1,886 | Web frontend development n=2,737 | Machine learning / AI n=2,298 | Industrial IoT n=945 | DevOps n=1,560

METHODOLOGY

The Developer Nation Survey

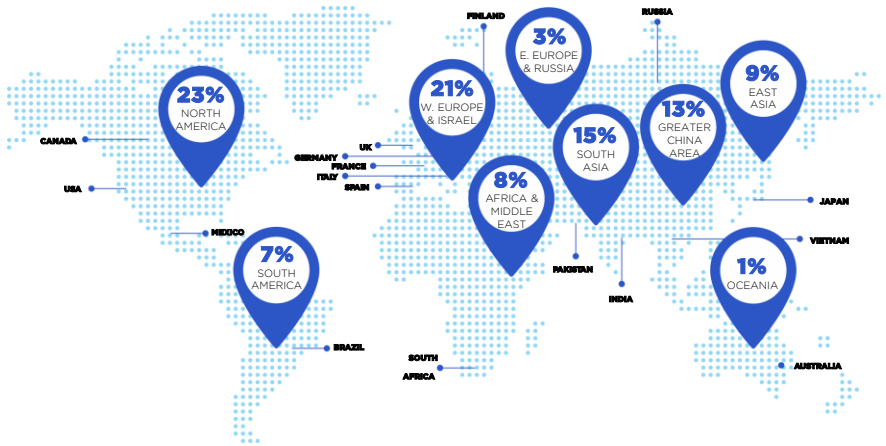
GLOBAL REACH

Geo distribution of respondents of the 30th global Developer Nation Survey (June to July 2025)

30th
GLOBAL WAVE

12,000+
DEVELOPERS

127
COUNTRIES REACHED



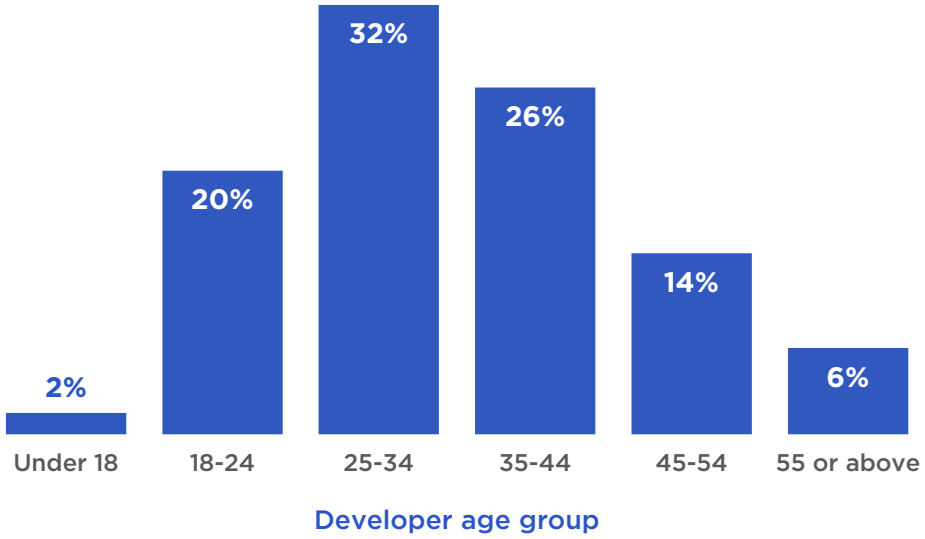
Developer Nation 30th edition reached 12,000+ respondents around the world. As such, the Developer Nation series continues to be the most comprehensive independent research on mobile, desktop, Industrial IoT, consumer electronics, 3rd party app ecosystems, backend, web, game, AR/VR and machine learning developers and data scientists combined ever conducted. The report is based on the large-scale online developer survey designed, produced and carried out by SlashData over a period of six and a half weeks between June 2025 and July 2025.

Respondents to the online survey came from 120+ countries, including the US, China, India, Israel and the UK. The geographic reach of this survey is reflective of the global scale of the developer economy. The online survey was translated into nine languages in addition to English (Simplified Chinese, Traditional Chinese, French, Spanish, Portuguese, Vietnamese, Russian, Japanese, Korean) and promoted by 48 leading community and media partners and the Developer Nation community within the software development industry.

Our respondents came from a broad age spectrum, from young coders and creators who are under 18 to the seasoned ones over 55. Excluding those who would rather not answer about their age, the age profile of our respondents is shown below.

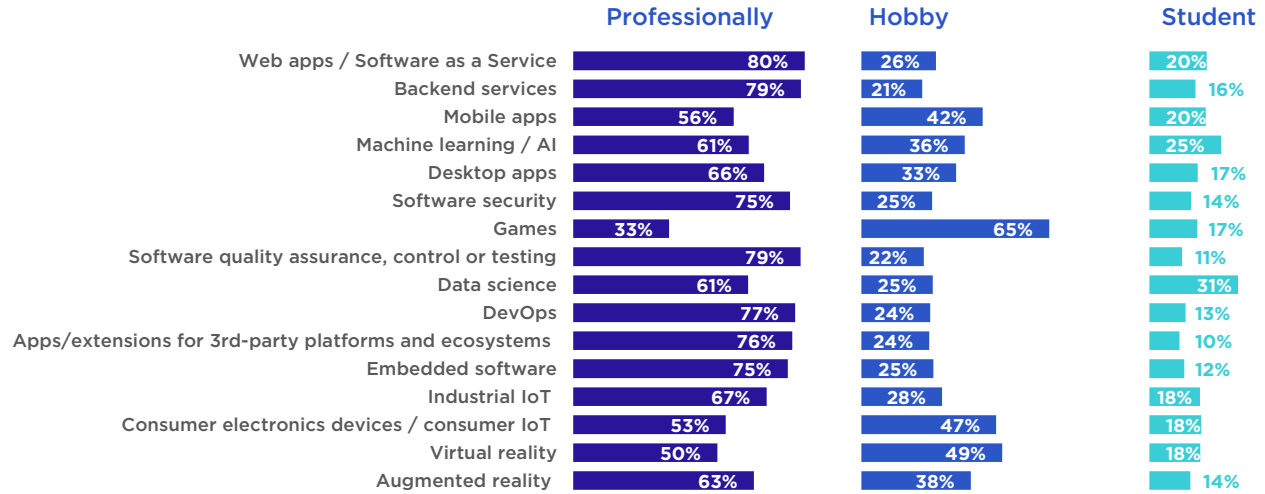
Age distribution of survey respondents

% of respondents (Q3 2025 n=11,975)



How respondents are involved in each software area

% of respondents in each area (Q3 2025 n=12,021)



Respondents were asked which types of projects they are involved in out of the 13 under study, namely web apps / SaaS, mobile apps, desktop apps, backend services, augmented reality, virtual reality, games, data science, machine learning / artificial intelligence, industrial IoT, consumer electronics devices, embedded software, and apps/extensions for third-party app ecosystems. They also told us if they are into their areas of involvement as professionals, hobbyists, or students - or as any combination of these - and how many years of experience they have in each.

METHODOLOGY

To eliminate the effect of regional sampling biases, we weighted the regional distribution across nine regions by a factor that was determined by the regional distribution and growth trends identified in our Developer Nation research. To minimise other important sampling biases across our outreach channels, we weighted the responses to derive a representative distribution for technologies used, and developer segments. Using ensemble modelling methods, we derived a weighted distribution based on data from independent, representative channels, excluding the channels of our research partners to eliminate sampling bias due to respondents recruited via these channels. Each of the separate branches: Industrial IoT, consumer electronics, 3rd party app ecosystems, backend, embedded, augmented and virtual reality were weighted independently and then combined.

For more information on our methodology please visit https://www.slashdata.co/methodology.

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