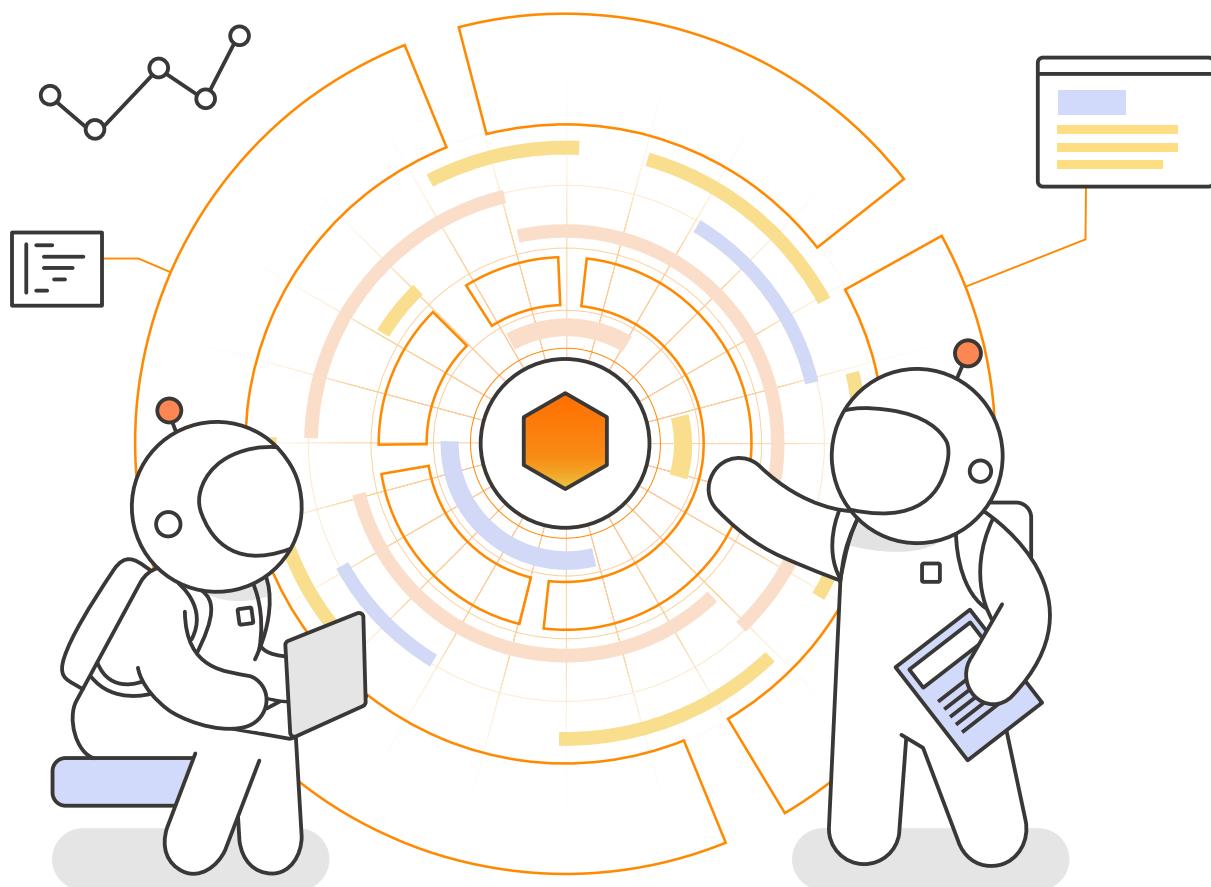




# 2022 State of the API Report

August 2022



# Table of Contents

Key Findings	3
Global Growth of APIs	7
Who Works with APIs	12
A Day, Week, or Year in the Life	16
API-First and Other Strategies	20
API Leadership and Governance	27
Executing on APIs	29
Tooling for APIs and Development	38
API Technologies	43
APIs and the Future of Work	47
Methodology	53



# Key Findings



# Key Findings

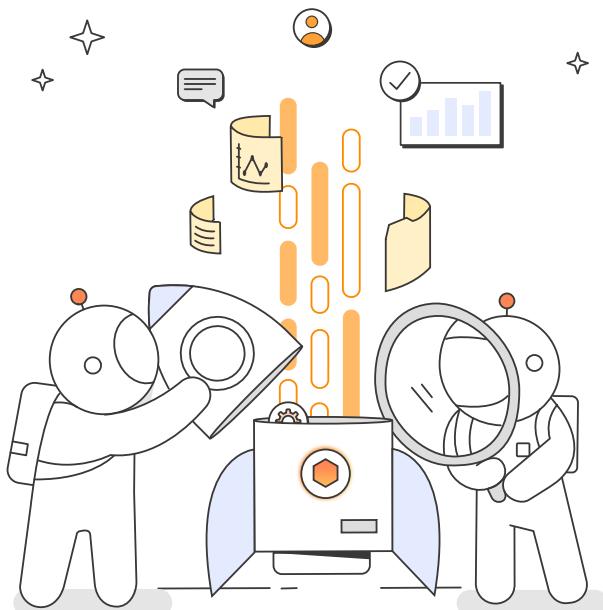
---

## Introduction

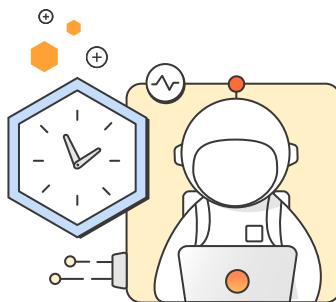
For the fourth year in a row, the State of the API is the largest and most comprehensive survey and report on APIs—and this year's was the biggest ever. More than 37,000 developers and API professionals shared their thoughts on topics including their organizations' development priorities, the tools they use, and where they see the industry going.

This year, we've again combined the survey findings with data we've observed on the Postman API Platform to build a robust picture of the current state—and the future—of APIs.

We've also expanded the scope of our survey to include developer and API professionals' thoughts on the economy, employment, and remote work. As a post-pandemic era dawns, these questions have taken on new urgency in the tech sector and beyond.



## Key Findings



### **Developers are spending most of their time on APIs**

Some 51% of respondents say that more than half of their organization's development effort is spent on APIs. That's up from 40% in 2020 and 49% last year, underscoring APIs' role as the building blocks of modern software.



### **API investments to remain strong, despite economic headwinds**

Investments in APIs will increase or stay the same over the next 12 months, said 89% of global respondents. When polling just executives, a similar level of confidence emerged among 1,400 CEOs, CIOs, and CTOs. These forecasts come even as two out of three respondents indicated a negative view of the current economy.



### **API-first leaders outperform**

While only 8% of respondents identified as API-first leaders, this small, elite group excelled on almost every metric. They produce APIs faster and have fewer failures. And they have brighter outlooks on employment and spending. When asked to evaluate API-first companies, more than three-quarters of all respondents agreed that developers at these companies are more productive, integrate with partners faster, and are happier.



### **Remote work is “very important”**

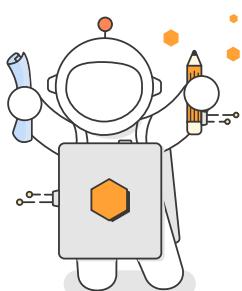
Much of the world views remote work as critical. In North America, 78% of developers and API professionals called it “very important,” exceeding the global figure of 72%. The findings come as many remote employees resist a return to the office.





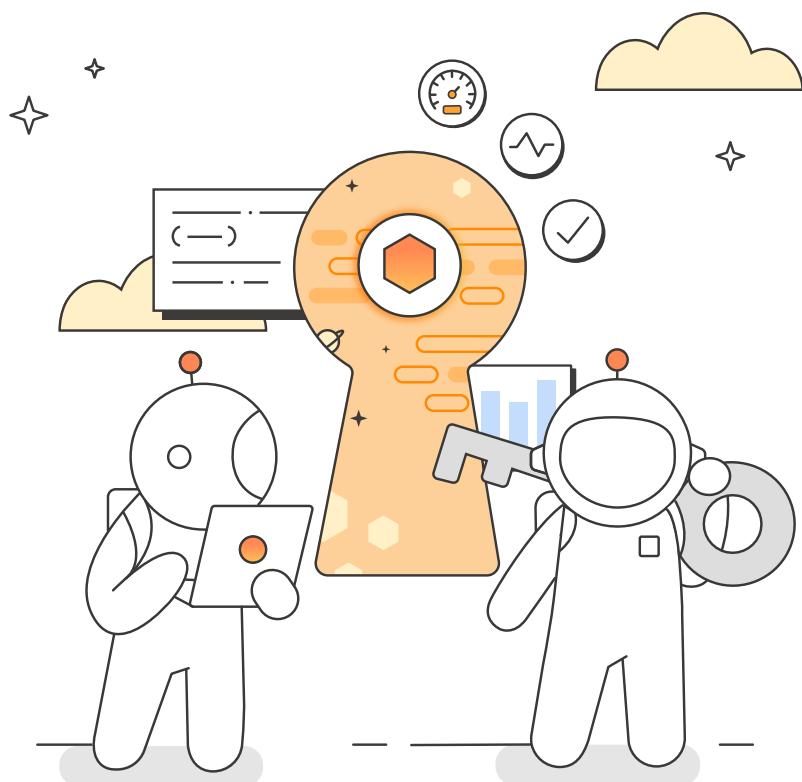
## Internal API integration is paramount

The number-one factor in deciding whether to consume and produce an API is how well it integrates with internal apps and systems. Last year, this consideration didn't even make the top three factors for API consumption. The shift suggests businesses are increasingly using APIs to share data and offer services internally.



## Lack of API design skills a top problem

One of the top obstacles to producing APIs is new this year: a lack of API design skills. This skills gap may be contributing to an overproliferation of microservices, which is creating its own problems.



# Global Growth of APIs



# Global Growth of APIs

---

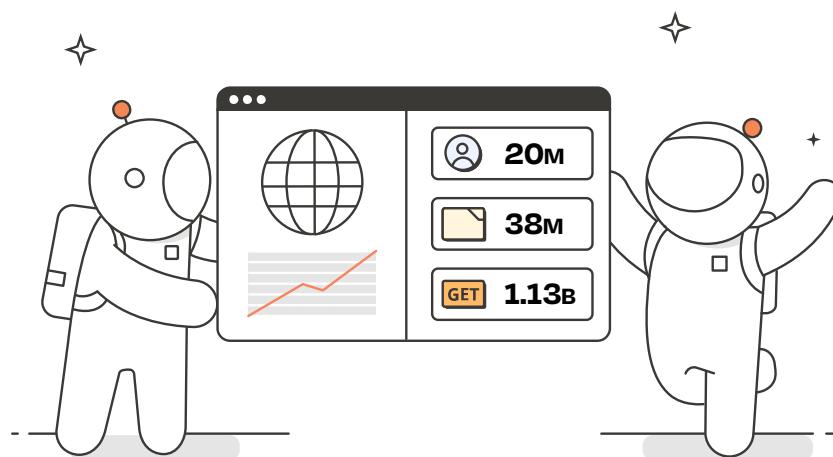
Over the last 12 months, the global growth of the API ecosystem has been strong, from the number of practitioners and countries represented to the number of API requests sent.

Since the 2021 State of the API report was released, the Postman API Platform saw significant surges in use:

**Users:** 20 million

**Collections created:** 38 million

**Requests sent:** 1.13 billion

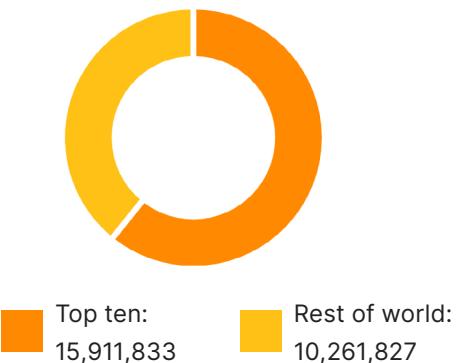


## APIs are global

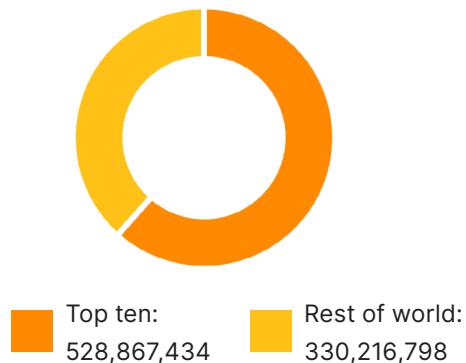
What are the top geographic regions creating collections and sending requests? We wanted to know, and we wanted to compare them with the rest of the world. Here's how it breaks down:

Countries and geographic areas: 234, including just about every country in the world, and even Antarctica

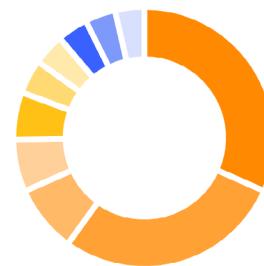
**Number of Collections Created**



**Number of Requests Created**



USA: 5,426,426
India: 4,669,393
China: 2,650,422
Brazil: 1,444,375
UK: 977,788
Russia: 800,647
France: 748,791
Germany: 714,916
Indonesia: 613,921
Canada: 591,357

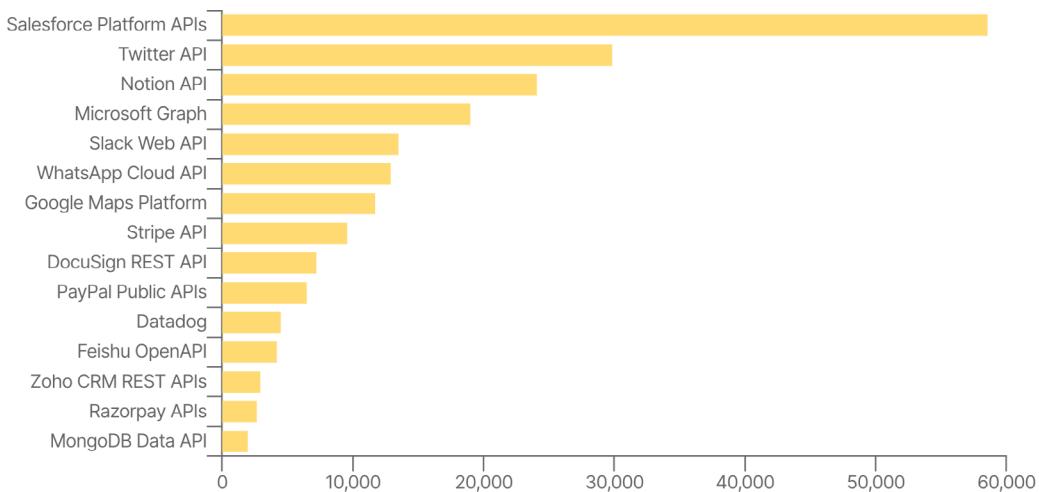


USA: 193,621,303
India: 173,219,417
China: 51,199,081
Brazil: 39,524,329
UK: 35,965,359
France: 25,922,549
Russia: 23,845,218
Indonesia: 23,276,800
Germany: 23,143,649
Canada: 22,056,181



## Most popular APIs

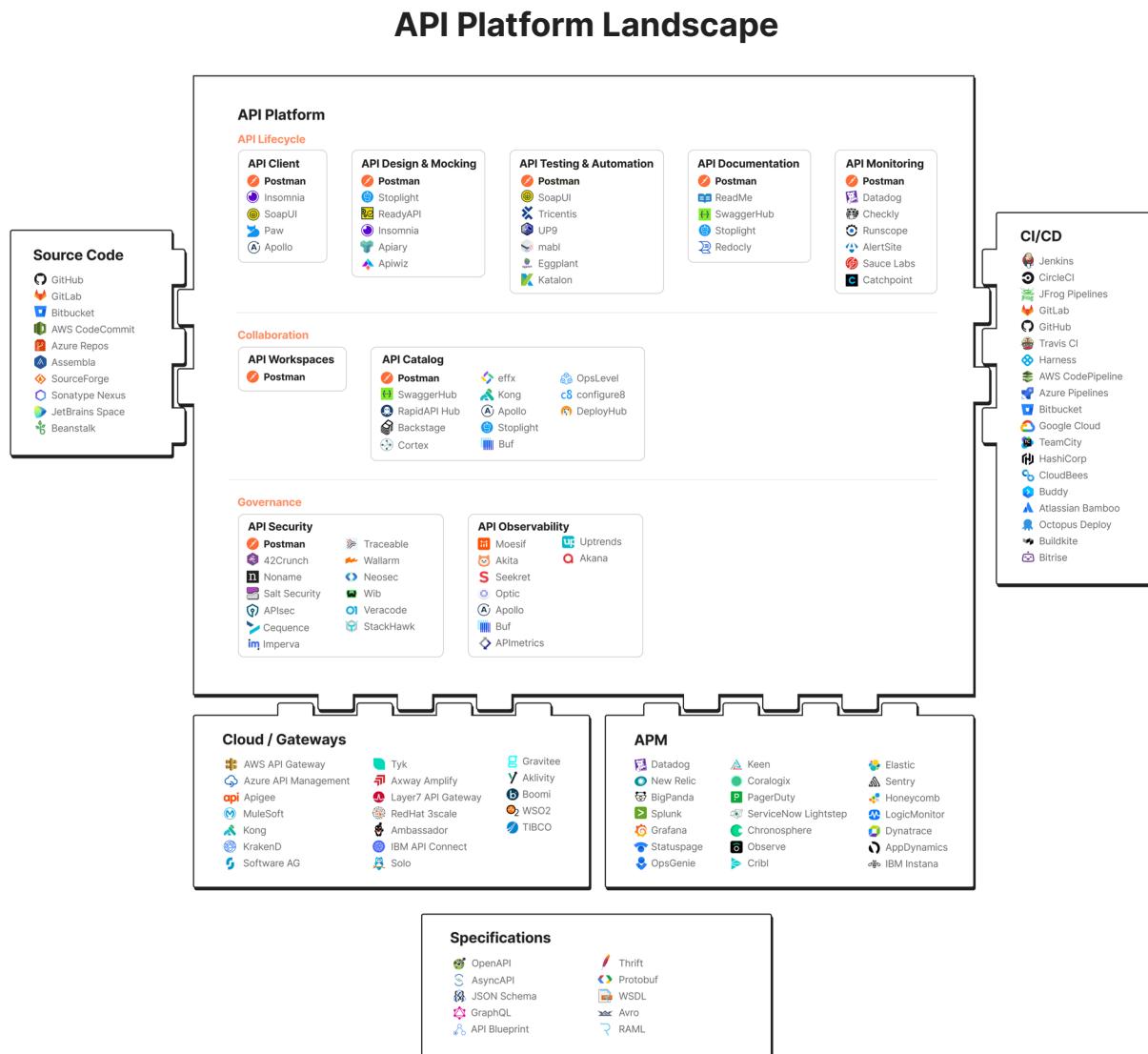
We looked across the Postman Public API Network, the world's largest public API hub, to see which API collections were forked most over the past year. Here's what we found:



## The 2022 API Platform Landscape

As more companies recognize APIs as the building blocks of modern software, API tools and services are evolving to meet their needs. These offerings span the API lifecycle, including design, testing, and security. They also include repositories for source code, API gateways, application performance monitoring, and CI/CD—all of which must integrate with API platforms to achieve optimal results.

Navigating this landscape requires careful thought. Here's our view of the API Platform Landscape today:



# Who Works with APIs



# Who Works with APIs

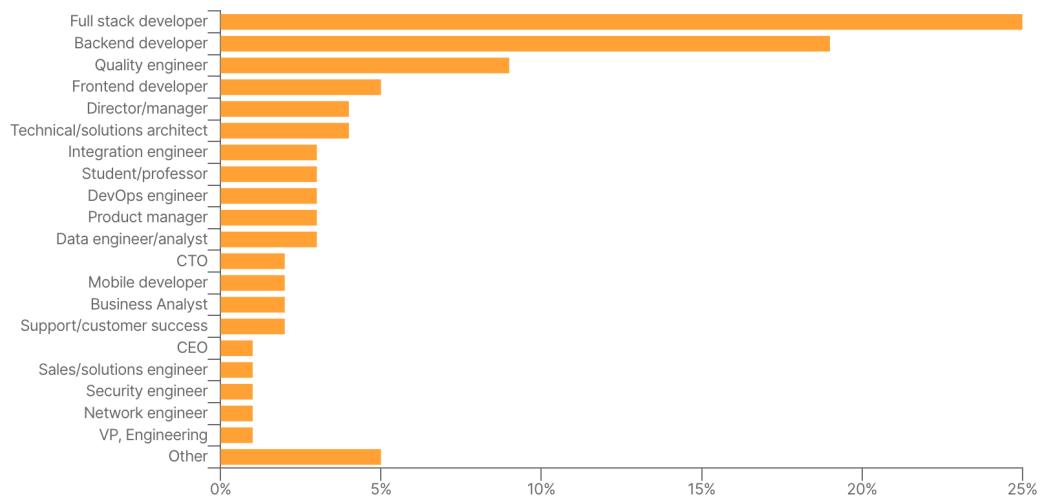
---

## Primary job function

We asked survey-takers about their primary roles, and for a second year they revealed an almost even split: nearly half of respondents were developers (full stack, backend, or frontend), and about half held non-developer roles.

Full stack developers were the largest single group at 25% of respondents, down slightly from last year's 27%. Backend developers showed a bit stronger representation at 19%, compared with 17% in 2021.

It's not just developers who work with APIs. A diverse range of professionals weighed in for this year's survey, including CEOs, business analysts, and customer success staff, who all shared their thoughts on APIs.

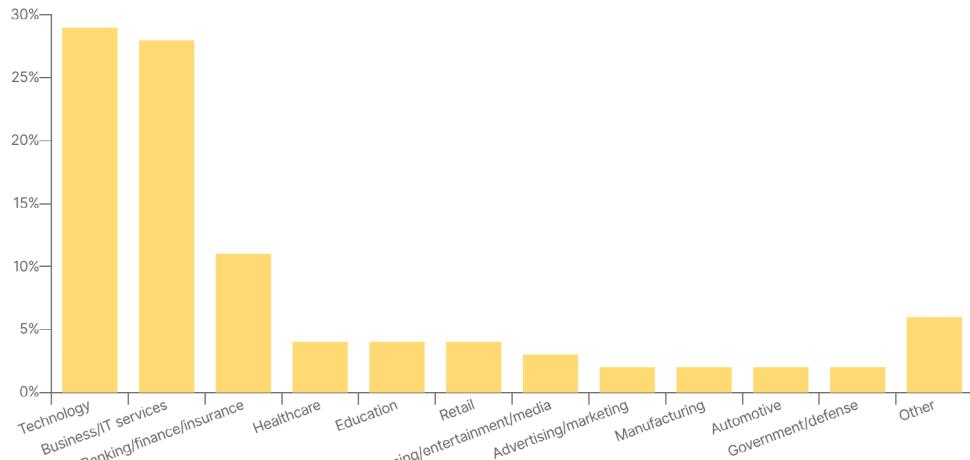


Due to rounding, percentages may not add up to 100%.



## Industry

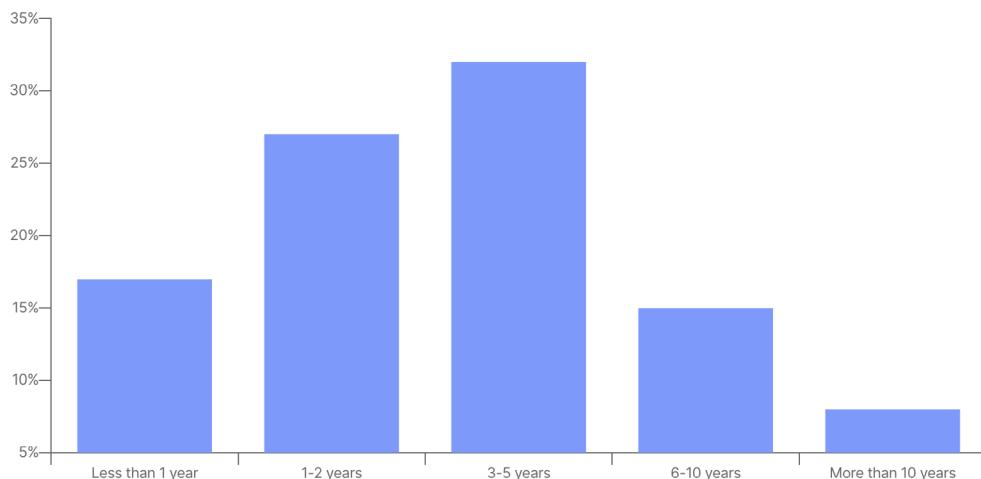
We asked about individuals' industries, and the results were clear: Technology remains the largest sector, followed by business/IT services, banking/finance/insurance, and healthcare.



Due to rounding, percentages may not add up to 100%.

## Years of experience

This year's survey recorded a surge in people working with APIs for the first time. More than one in six respondents had less than a year of API development experience, compared with just one in 25 people last year.

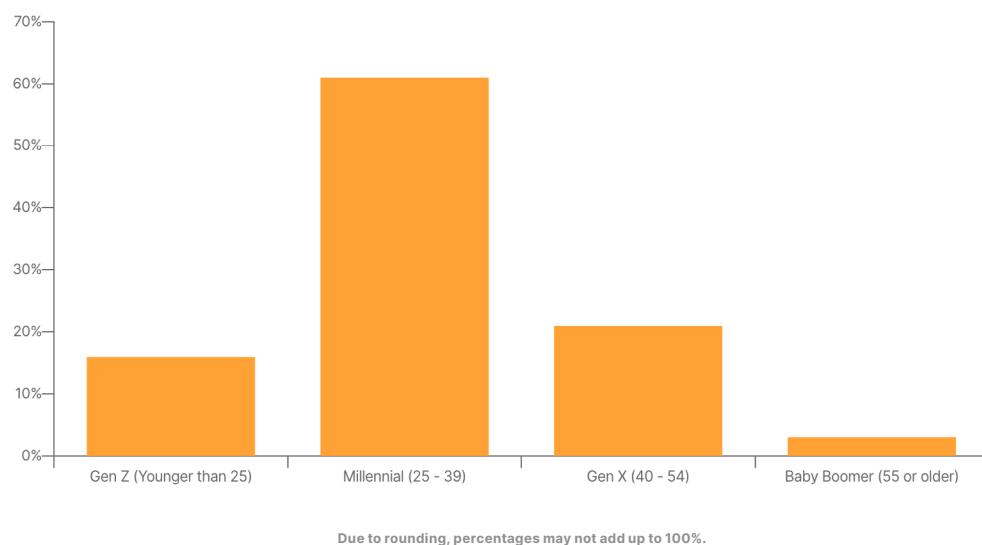


Due to rounding, percentages may not add up to 100%.



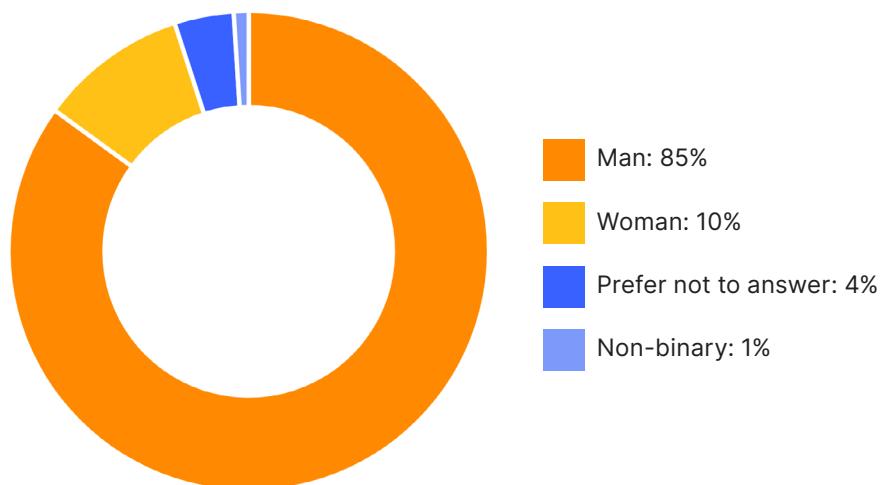
## Generation

The bulk of respondents again identified themselves as Millennials, followed by Gen X, Gen Z, and finally Baby Boomers.



## Gender

Like much of the software sector, the world of APIs appears to skew male. Some 85% of survey-takers identified as men. Only 10% of respondents identified as women, 1% as non-binary, and 4% preferred not to answer. The disparity underscores the continued need for initiatives that support workplace diversity.



# A Day, Week, or Year in the Life

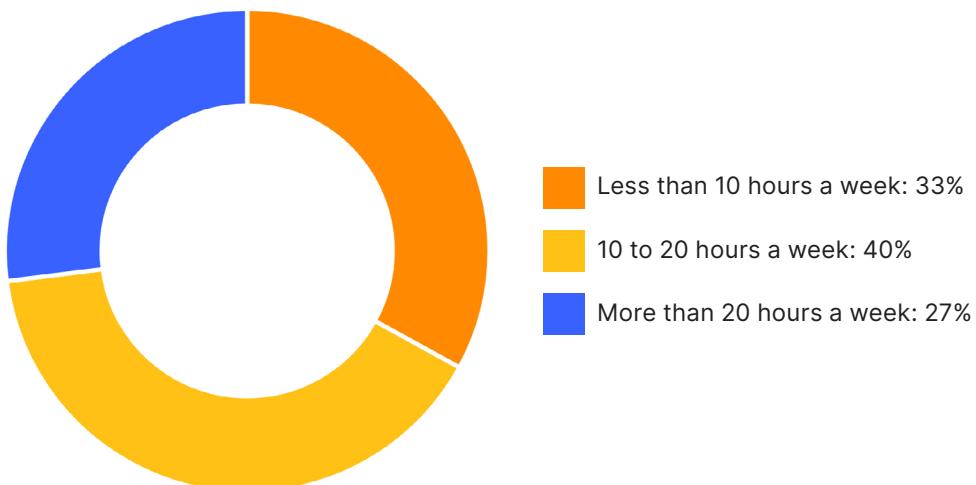


# A Day, Week, or Year in the Life

---

## Hours spent with APIs

When it comes to the number of hours a week developers are spending with APIs, the figures for 2022 mirrored last year's. When we drill down deeper into the numbers, we see that certain roles spend far more hours than others. Over 40% of backend developers devote more than 20 hours a week on APIs, the highest percentage in the survey.

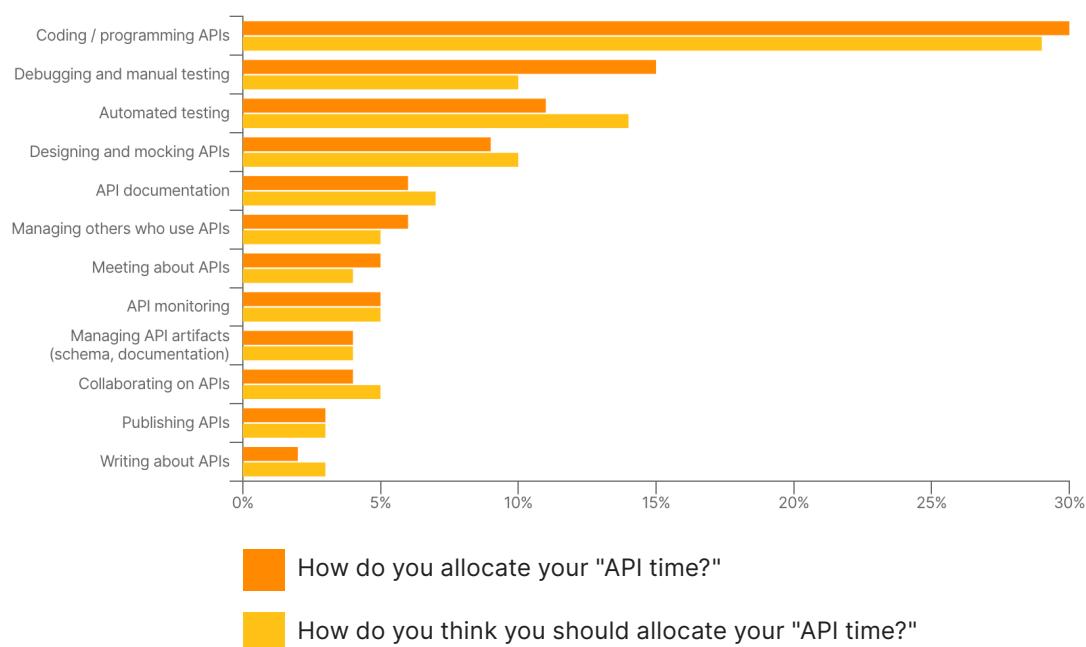


## API time: present and ideal state

We asked individuals how they spend their time working with APIs today, and how they'd ideally like to allocate that time. The biggest portion of their API time—almost a third—is now spent coding and programming, which matched their ideal state.

The second-biggest portion of their API time is spent debugging and manual testing. It's a sometimes tedious task, and respondents wished they could cut the amount of time spent here by a third.

Interestingly, API-first leaders spend less time on this chore. While the average respondents devoted 15% of their API time to debugging and manual testing, API-first leaders dedicated just 13%. Those who were the least API-first spent the most time, at 17%.

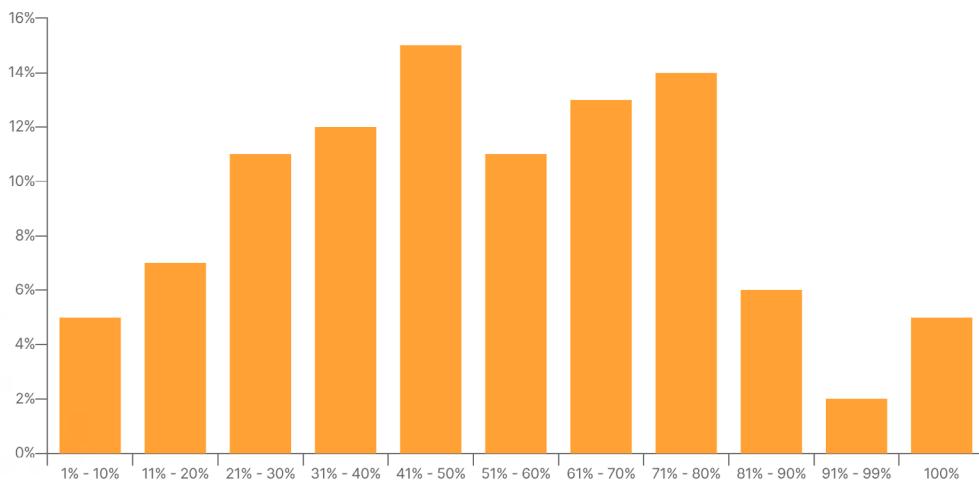


Due to rounding, percentages may not add up to 100%.



## API development effort

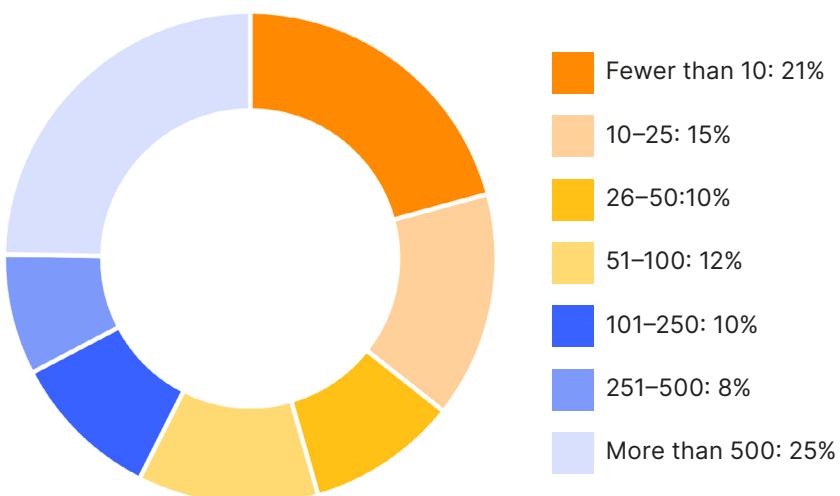
For the first time, a majority of respondents (51%) said most of their organization's development effort was spent working with APIs. That's up from 49% last year and 40% in 2020. This milestone in development comes as more companies employ APIs for internal and external products and services.



Due to rounding, percentages may not add up to 100%.

## Number of developers in the organization

Respondents from organizations with more than 500 developers were most common, at 25%; however, the next largest category—those with fewer than 10 developers—accounted for 21% of respondents. These figures largely line up with last year's survey.



Due to rounding, percentages may not add up to 100%.



# API-First and Other Strategies

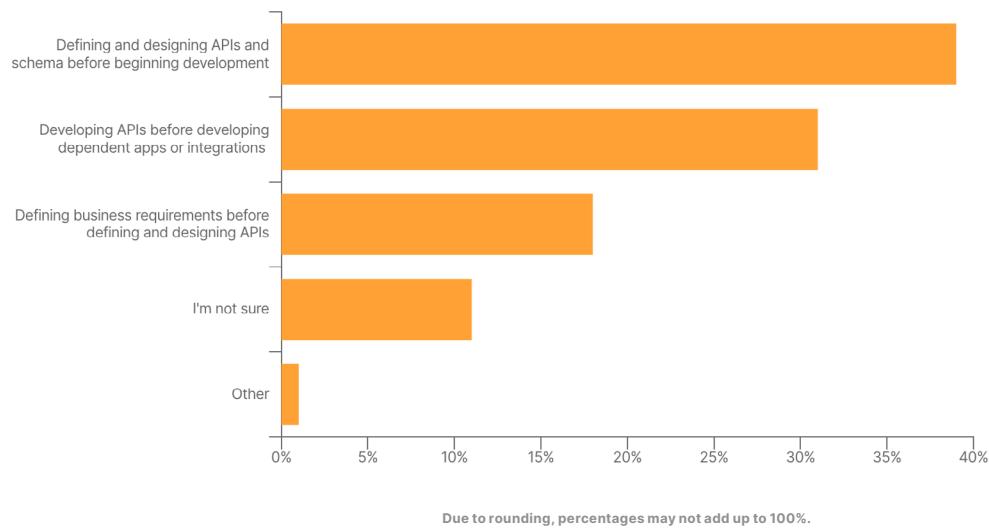


# API-First and Other Strategies

---

## Defining API-first

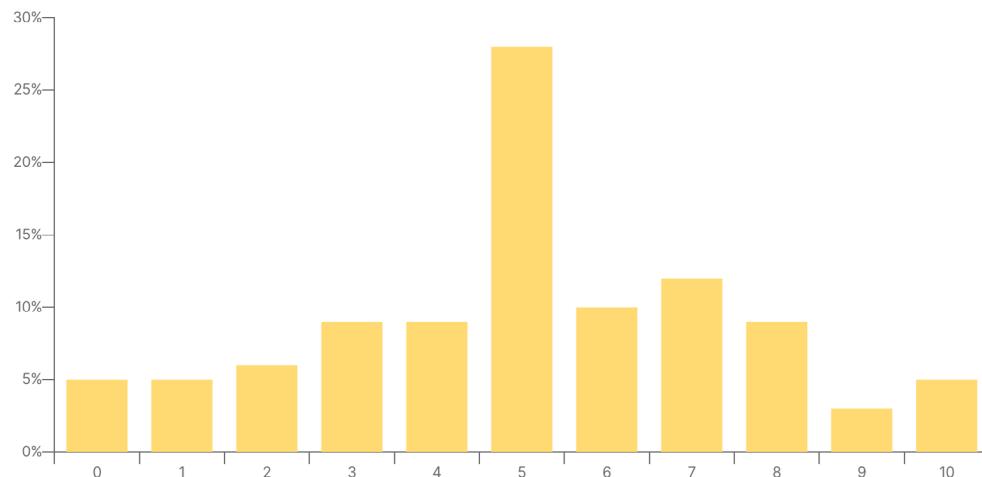
What does “API-first” mean to API developers and professionals? The industry as a whole appears to favor this definition: *defining and designing APIs and underlying schema before developing dependent APIs, applications, or integrations*. The next favorite? Almost three out of every 10 developers and API professionals preferred the definition of *developing APIs before developing applications or integrations dependent on APIs*.



## Embracing API-first

Teams and organizations continue to embrace an API-first philosophy. Two-thirds of this year's survey respondents again ranked themselves as a five or higher in terms of embracing API-first. A select few lead the way: 8% rank themselves as 9 or 10 on the scale of embracing API-first.

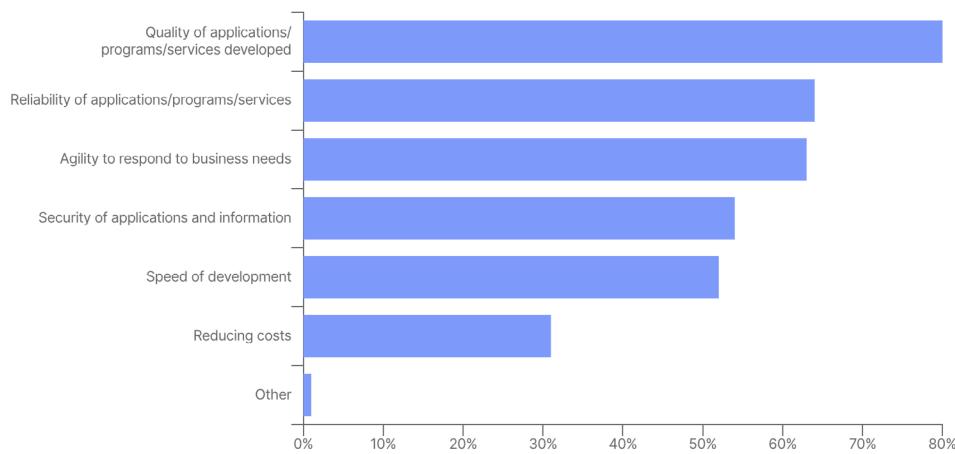
We refer to these respondents as "API-first leaders." Some 76% of them spend a majority of their development efforts on APIs, compared with 51% for all respondents.



Due to rounding, percentages may not add up to 100%.

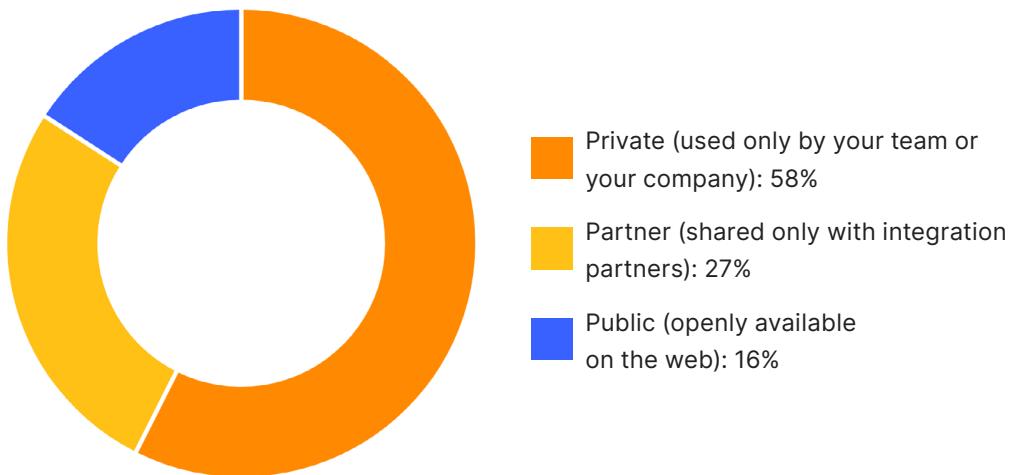
## Development priorities

We asked respondents to identify the top priorities for their development teams and organizations, and quality remained the clear winner, coming in at 80%. Agility, reliability, security, and speed of development were also important to more than half of respondents. What seemed to be less of a concern? Reducing costs, cited by less than one-third of API professionals. API-first leaders were even more likely to cite quality, reliability, agility, and security as priorities than other survey respondents.



## Public vs private vs partner

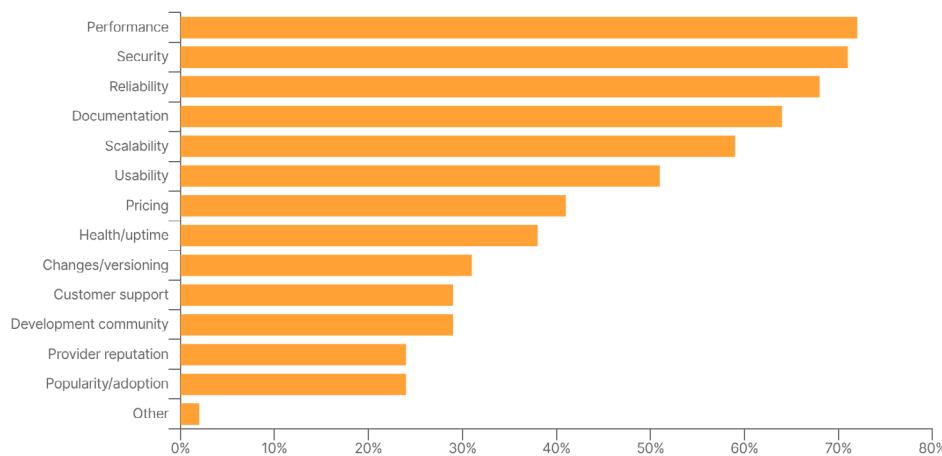
Respondents were asked to allocate 100 points among three API categories (public, private, and partner) to indicate the percentage of APIs in their organization for each. The leader remains private APIs. Interestingly, API-first leaders reported a lower percentage of private APIs and higher percentage of public APIs, indicating that these leaders spend less time coding functionality in-house when they can rely on functionality already publicly available from others across the industry.



## API integration: what matters most?

When we asked what factors are considered before integrating with an API, respondents told us performance was the top factor. This just barely edged out last year's number-one pick, security. Reliability and documentation remained among the top four factors. Also notable were scalability and usability.

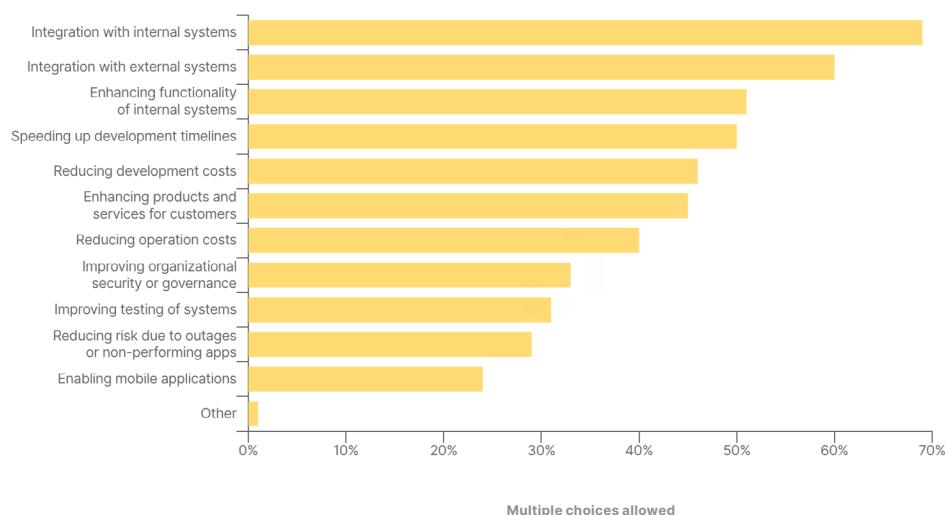
API-first leaders were more likely than other respondents to cite the top four factors: performance, security, reliability, and documentation.



## Consuming APIs: internal integration is key

We asked what factors went into an organization's decision to consume an API, and the top answer this year was a surprise. The number-one choice, by far, was how well an API integrates with internal apps and systems. That's a big change from last year's survey, where internal integration wasn't even among the top three considerations.

This shift comes as companies increasingly use APIs to interact inside the organization, possibly replacing traditional methods like file transfer, database sharing, and email. In the past year, the Postman API Platform has seen the number of integrated APIs across enterprise teams jump twentyfold.



“

What I like about being at an API-first company is the product. When we dogfood—when we write friction logs on what's working, what's not, what could be better—we see ourselves as a developer-experience company, first and foremost. The tiebreaker on almost every discussion or debate we have is, ‘Are we doing right by our developers in the offering of the API?’ Everything else comes in support of that.”

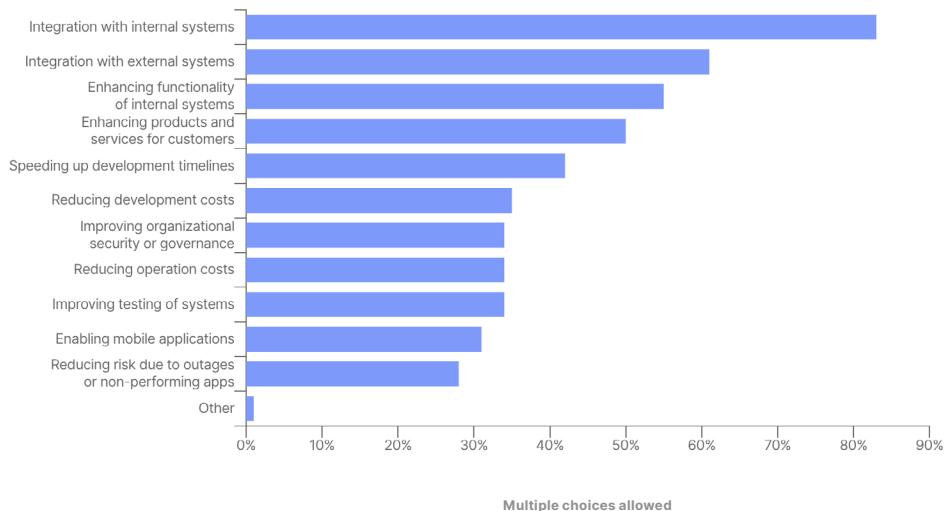
**Chris T.**, engineering manager



## Producing APIs: heavier focus on internal integration

What factors do respondents consider when deciding whether to produce an API? Their top answer was the same as last year: integration with internal apps and systems. But this year, the factor jumped in importance: 83% of respondents selected it, up from 67% last year.

Internal integration rose in importance this year for both producing and consuming APIs. It's a shift that bears watching, as it has implications for API documentation and design, as well as the full development lifecycle.



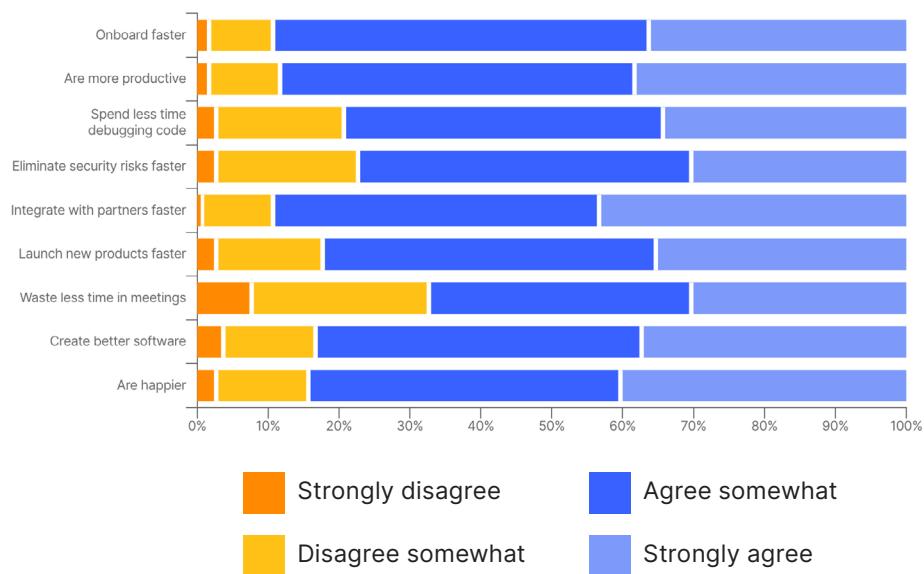
**“** Most of my developers are acquired through corporate M&A. The only way we can get internal cross-team collaboration is through APIs. There are a lot of different ways people are documenting and sharing things—setting up workspaces and teams as part of the onboarding process. I can't think of how we'd work without APIs.”

**Paul C., technical lead**



## It pays to be API-first

We asked developers and API professionals their opinion about the benefits of an API-first approach to development. At least 75% of respondents agreed that developers at API-first companies are happier, launch new products faster, eliminate security risks sooner, create better software, and are more productive.



Due to rounding, percentages may not add up to 100%.



# API Leadership and Governance

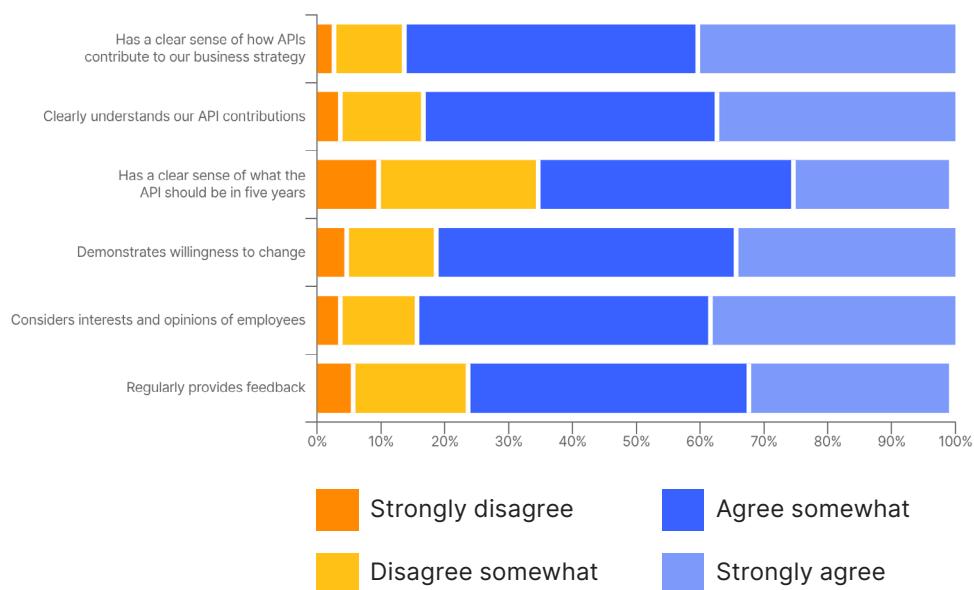


# API Leadership and Governance

---

## Evaluating company leadership

We asked respondents to evaluate their API leadership or governance group across six areas. A great majority said their leadership had a clear sense of how APIs contributed to the business strategy. A smaller proportion said the same leadership had a sense of what the API should look like in five years.



Due to rounding, percentages may not add up to 100%.



# Executing on APIs



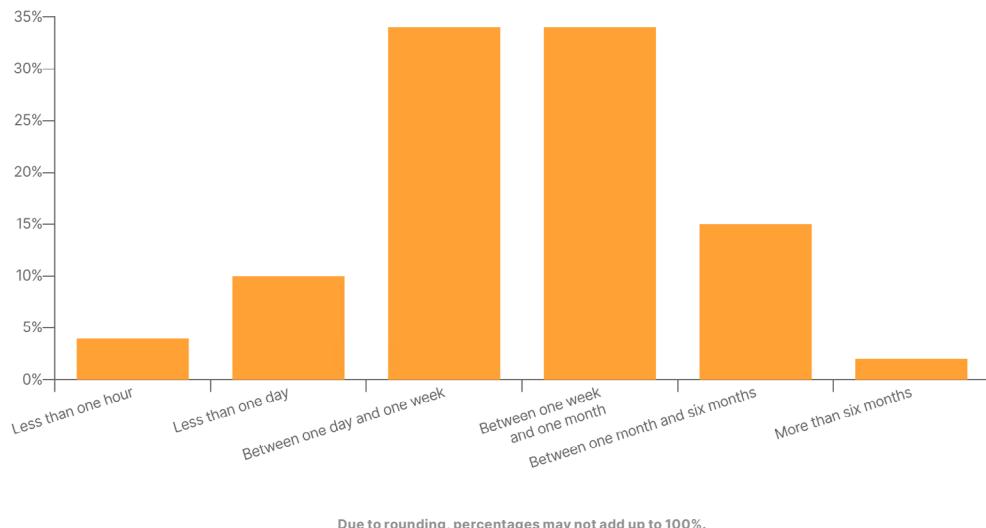
# Executing on APIs

---

## Time to production

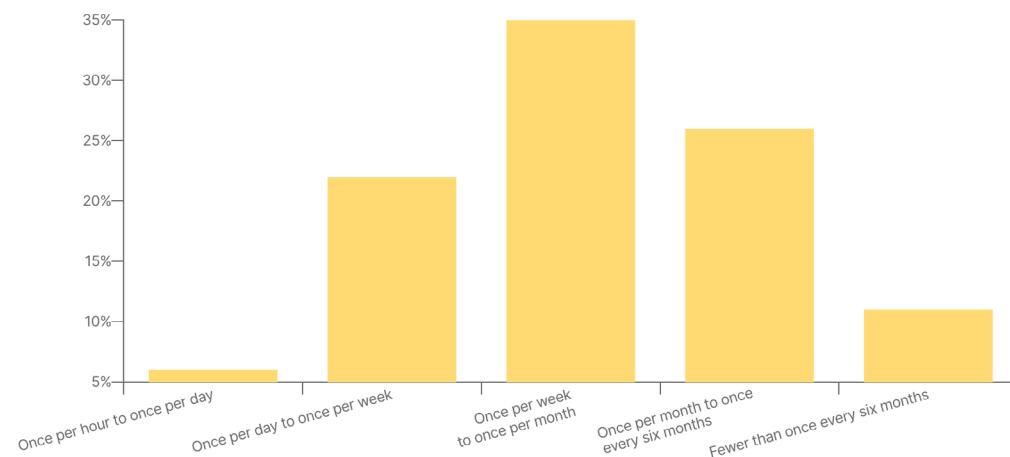
We asked survey participants how long it typically takes to conceive, implement, test, and deliver an API to a production environment. The results were largely unchanged from last year.

About one-third stated that it takes one day to one week, and another third said it takes one week to one month. A handful of participants said they can complete the process in less than a day (or an hour), and another handful takes more than a month. API-first leaders are faster—with 19% being able to finish the process in a day or less (versus 14% of all respondents).



## Deployment frequency

We also asked participants how frequently they deploy APIs to production. The most common response? A bit more than one-third stated that they deploy APIs to production between once per week and once per month. Almost one-fourth of respondents deploy between once per day and once per week. For API-first leaders, it's more frequent: More than 10% deploy between once per hour and once per day.



Due to rounding, percentages may not add up to 100%.



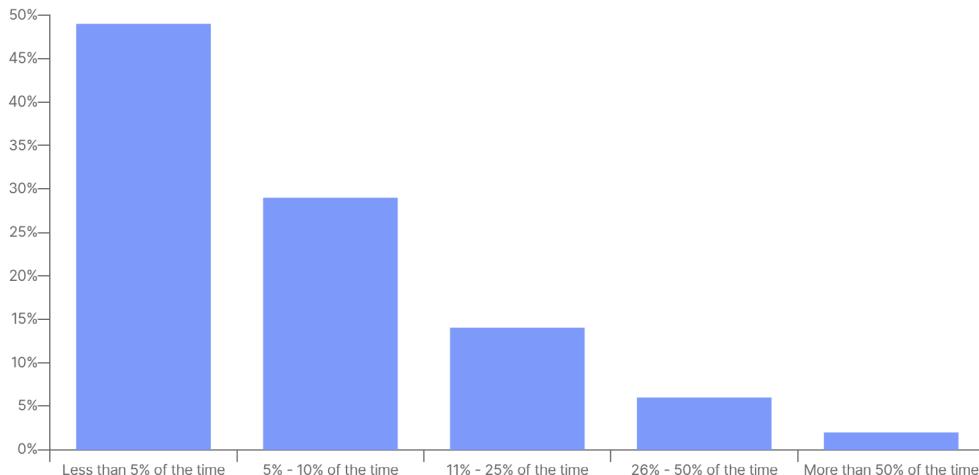
For us, it's about going from ideation to working software as quickly as possible, and producing artifacts that resemble working software."

**Doug R.**, platform architect



## Deployment failures

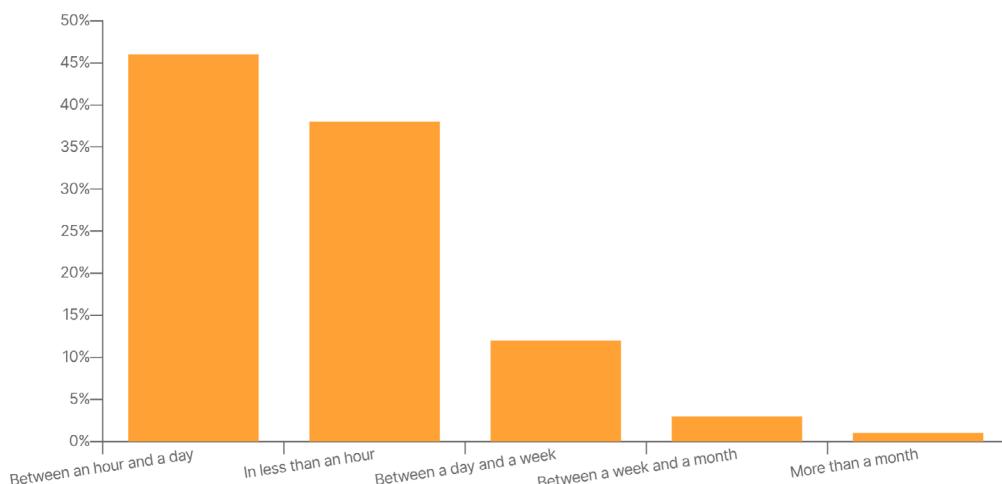
Next, we asked participants what percentage of their API changes pushed to production experience failure. Almost half of developers and API professionals said that less than 5% of their changes fail. API-first leaders were even less likely to experience production failures, with 60% stating that failures occur in less than one in 20 deployments.



Due to rounding, percentages may not add up to 100%.

## Time to recovery

We asked participants how long it typically takes them to recover when APIs fail. Some 38% said they could recover in less than one hour, an improvement from 34% of respondents last year. And fewer developers than last year indicated they would need a full day. API-first leaders said that they could recover more quickly, with 44% indicating they could be back up in less than an hour (versus 38% of all respondents).



Due to rounding, percentages may not add up to 100%.

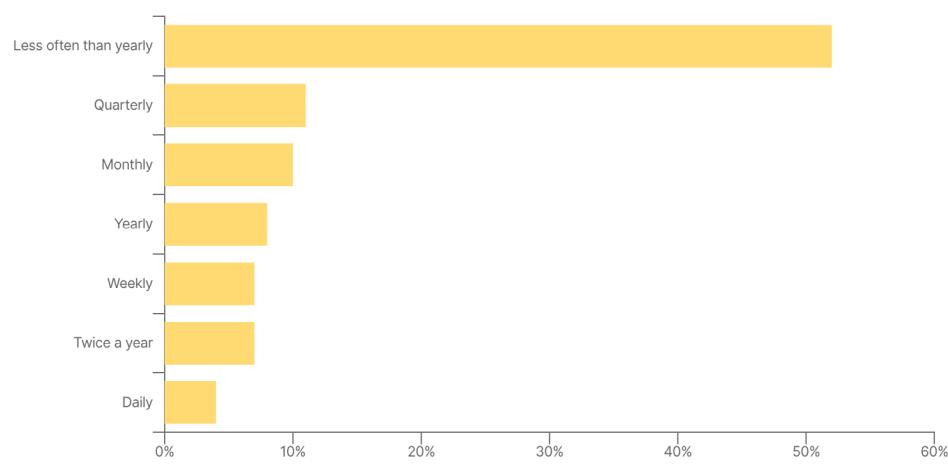


## Frequency of API security incidents

Some 20% of respondents said API security incidents occur at least once a month at their organization, resulting in loss of data, loss of service, abuse, or inappropriate access. While the overall picture was more reassuring—52% said incidents happen less than once a year—the data underscores the importance of shifting left on security and incorporating it early in the API lifecycle.

Interestingly, API-first leaders reported more frequent security incidents, with 25% experiencing incidents at least once a month.

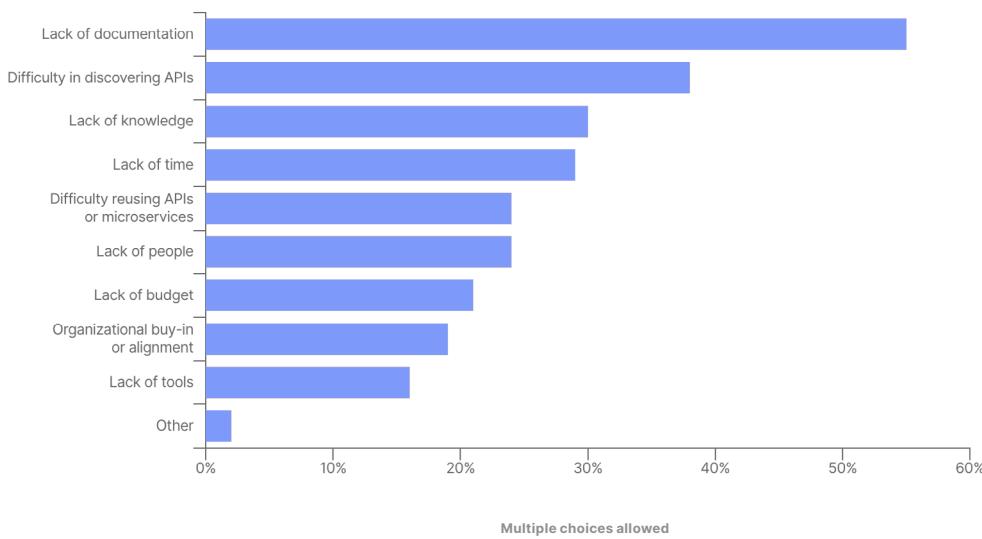
We hypothesize this is because API-first leaders deploy more APIs and have broader visibility of them; in fact, these organizations are twice as likely to deploy APIs daily. As such, they may detect security events that might escape notice at less API-first companies.



## Obstacles to consuming APIs

When asked about obstacles to consuming APIs, respondents said the number-one hindrance was lack of documentation, chosen by 55%. Other top obstacles to consuming APIs include difficulty in discovering APIs (38%) and lack of knowledge (30%).

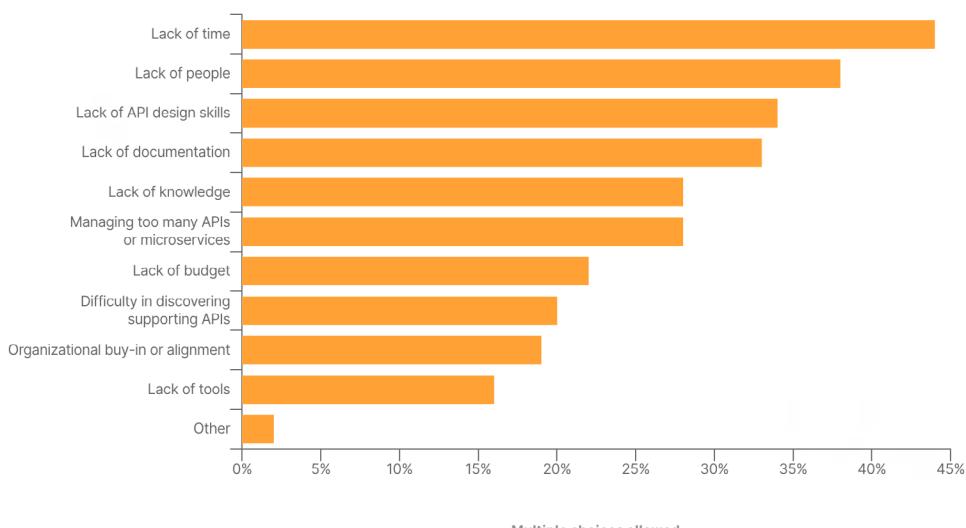
API-first leaders, on the whole, were less likely to cite any obstacles—with one exception. They reported greater difficulty reusing APIs or microservices: some 26% of API-first leaders cited this pain point, compared with just 24% for respondents overall.



## Obstacles to producing APIs: Lack of design skills

Lack of time was again organizations' biggest obstacle to producing APIs, followed by lack of people. But the third-biggest hindrance was new this year: lack of API design skills.

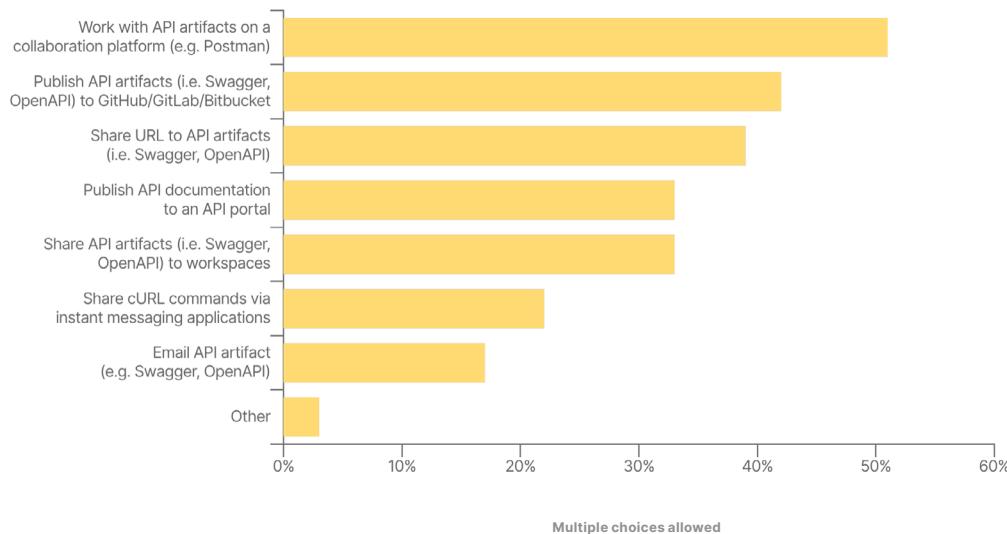
A gap in API design skills may be contributing to an overproliferation of microservices, which is a problem in itself. Managing too many APIs or microservices was respondents' sixth biggest obstacle to producing APIs. Among API-first leaders, it's an even bigger problem: too many microservices was their second-biggest obstacle.



## Collaborating on APIs

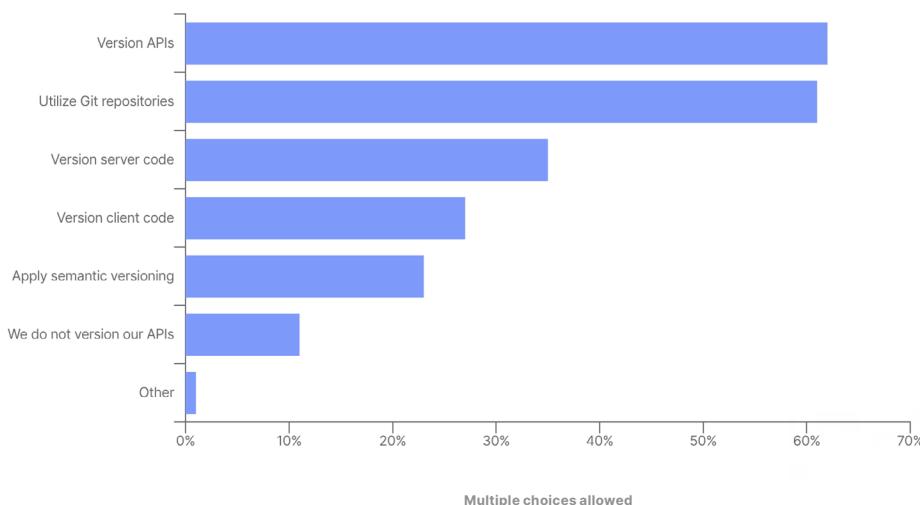
When we asked how respondents collaborate, their top answer was working with API artifacts on a collaboration platform (51%). Next up, with 42%, was publishing API artifacts to GitLab, GitHub, Bitbucket, etc.

On the Postman platform in the past year, the percentage of users collaborating doubled as developers and API professionals worked together on collections, APIs, folders, and other entities.



## Change management

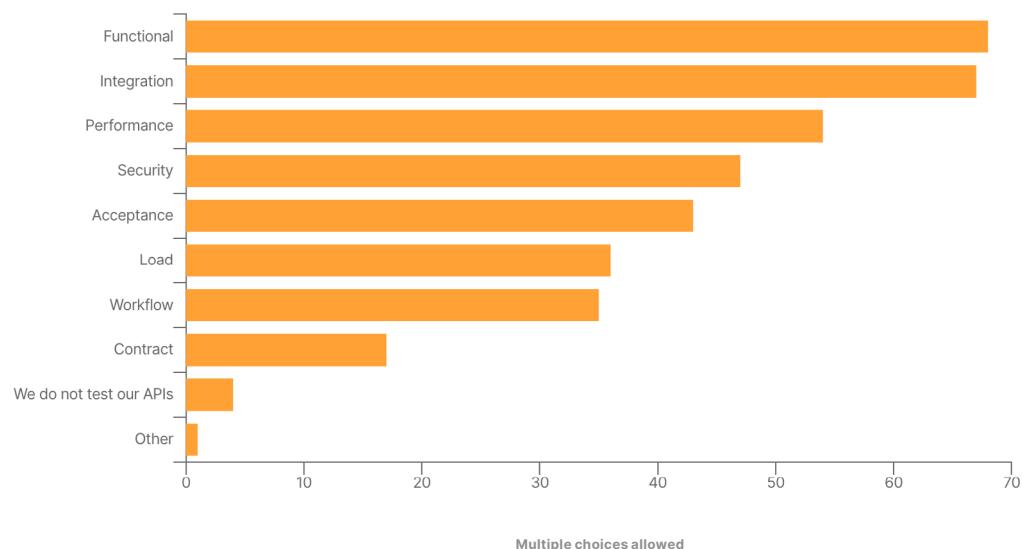
When it comes to preferred change-management practices, versioning APIs again scored the most mentions—just barely—at 62%. Use of Git repositories grew in popularity to 61%, up from 58% last year. Semantic versioning also saw a boost, from 20% last year to 23% this year.



## API testing

When it comes to API testing, a wide variety of practices are applied, although functional testing (68%) and integration testing (67%) dominated the answers, with no other testing practice coming within ten percentage points of those two choices.

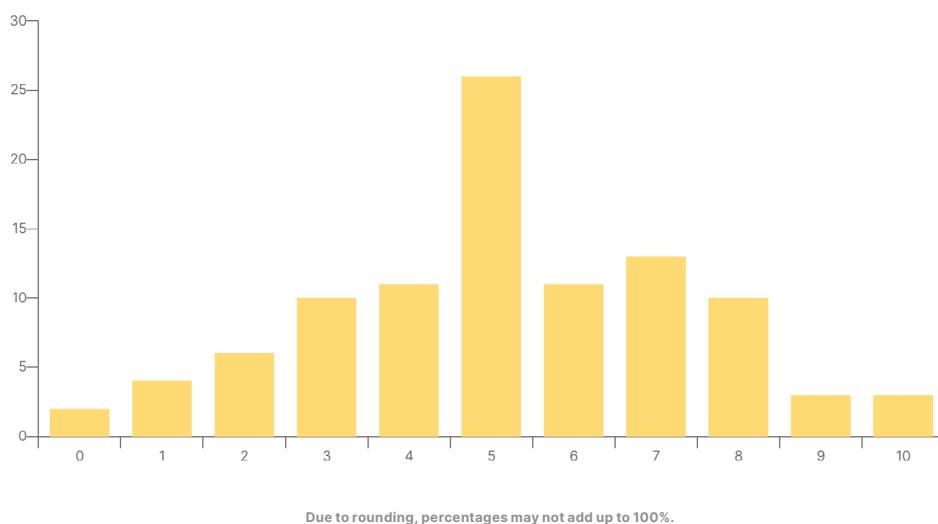
Across the board, almost every practice saw an increase of one to three percentage points from last year, which suggests teams may be expanding their testing methods.



## API documentation

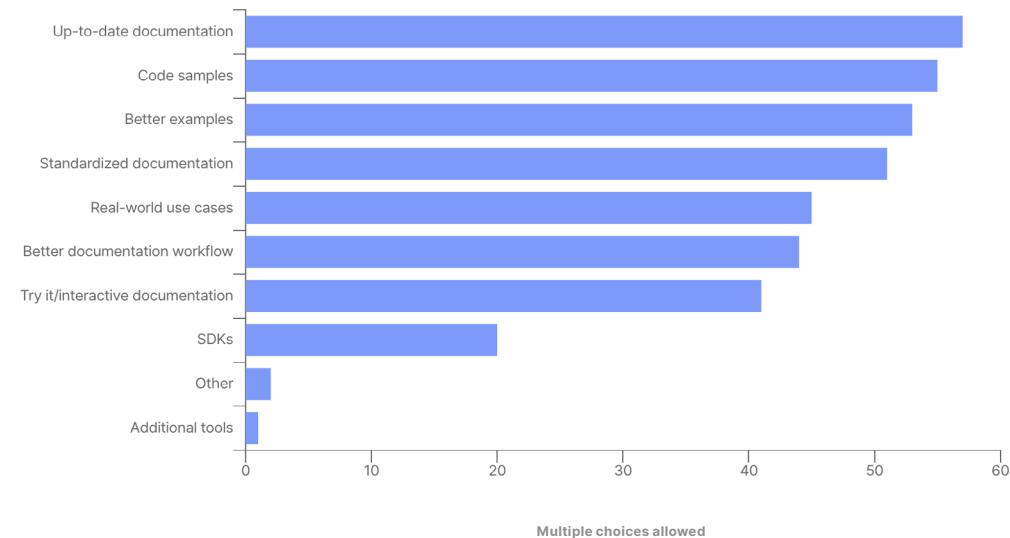
We asked how well APIs are documented, and the results resembled a bell curve, with the highest percentage of respondents (26%) indicating that documentation scored a 5 out of 10 (or "okay").

Only 3% of respondents rated APIs they work with as "very well documented."



## Improving API documentation

What would improve documentation? Respondents said the most helpful enhancement API producers can make is to provide up-to-date documentation (57%), followed by code samples (55%) and better examples (53%).



# Tooling for APIs and Development

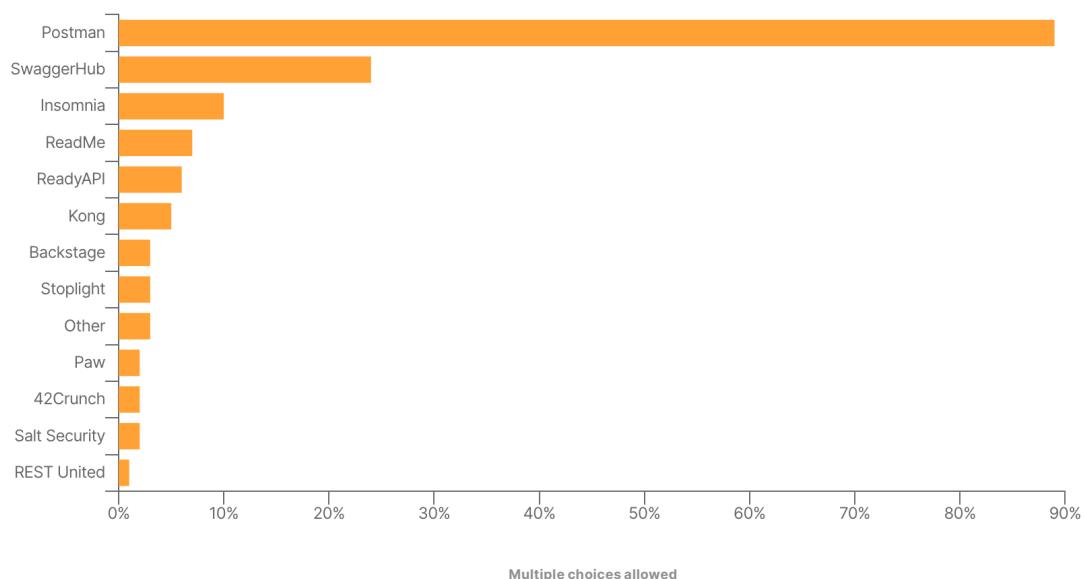


# Tooling for APIs and Development

---

## API platforms and tools

When respondents were asked which API tools and platforms they use, Postman led the way, garnering mentions from 89% of respondents. SwaggerHub and Insomnia also posted double digits at 24% and 10%, respectively.

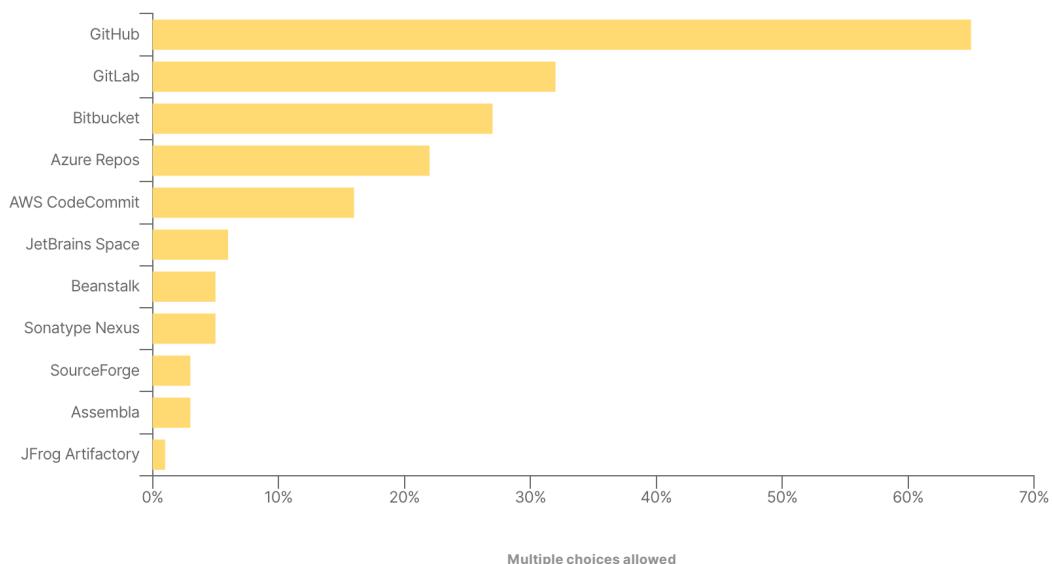


“ Today’s API developers may speak English, Spanish, JavaScript, Python, and Java, but we also speak the language of workspaces, collections, and monitors routinely. These terms have become part of our everyday vocabulary, helping us collaborate effectively among API producers and consumers.

**Swapnil S.**, senior tech lead

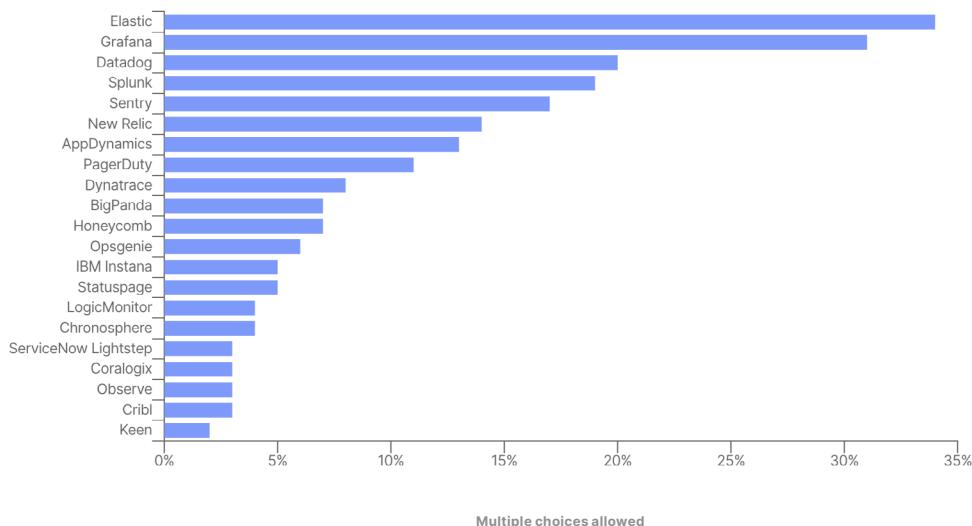
## Source code tools

In a new question, we asked which tools or platforms respondents used for source code. GitHub was the most popular choice at 65%, followed by GitLab, which was at 32%, and Bitbucket at 27%. Newer names such as JetBrains Space showed some recognition as well.



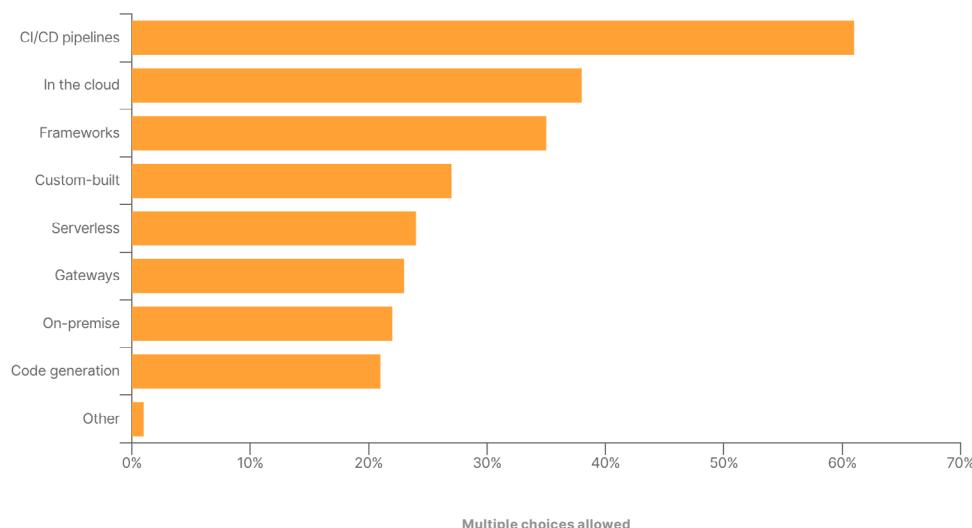
## Application performance management

For the first time, we also asked about the most commonly used APM tools. Taking the lead was Elastic (34%) then Grafana (31%), followed by Datadog (20%) and Splunk (19%).



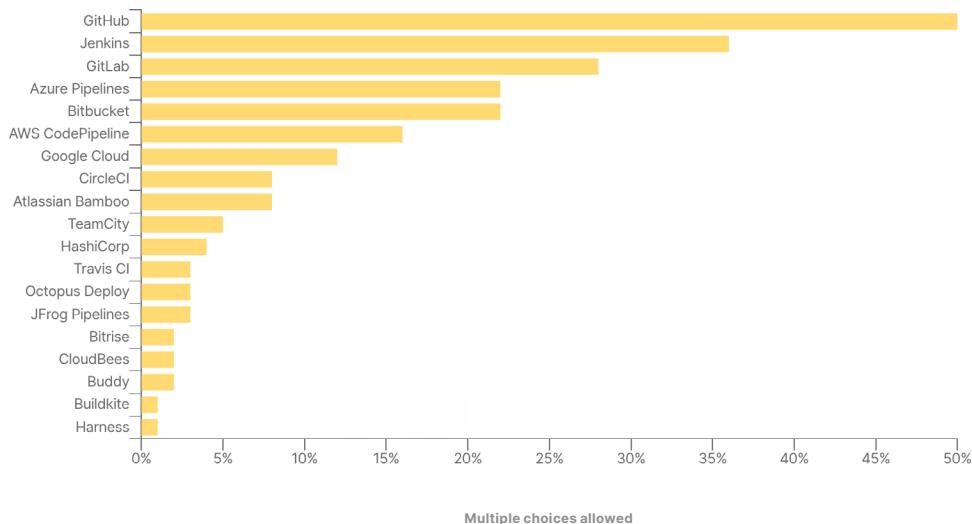
## Deploying APIs

Respondents who deploy APIs reported using a number of approaches. CI/CD pipelines were even more popular than last year, with 61% of respondents citing them as the most common tool. Following them were deploying APIs in the cloud (38%), frameworks (35%), and custom-built deployment methods (27%).



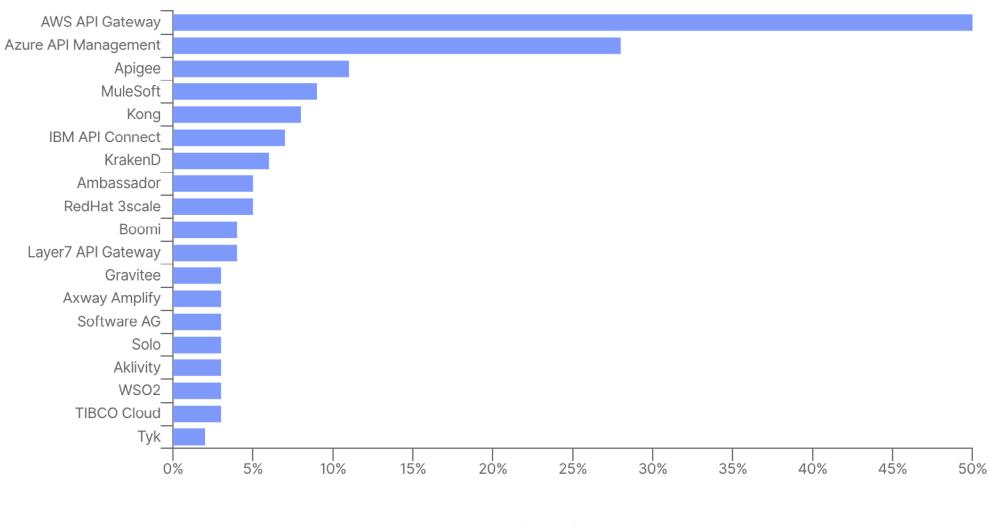
## CI/CD tools and platforms

When asked which CI/CD solutions were favored, half of respondents cited GitHub. Jenkins (36%) and GitLab (28%) were also popular choices, followed by Azure Pipelines and Bitbucket (22% each).



## API gateways and cloud API management

When it comes to API gateways or cloud API management tools, two solutions stood out. Half of respondents cited AWS API Gateway, and a bit more than a quarter mentioned Azure API Management. Some 11% cited Apigee, and from there solutions posted single-digit figures.



# API Technologies

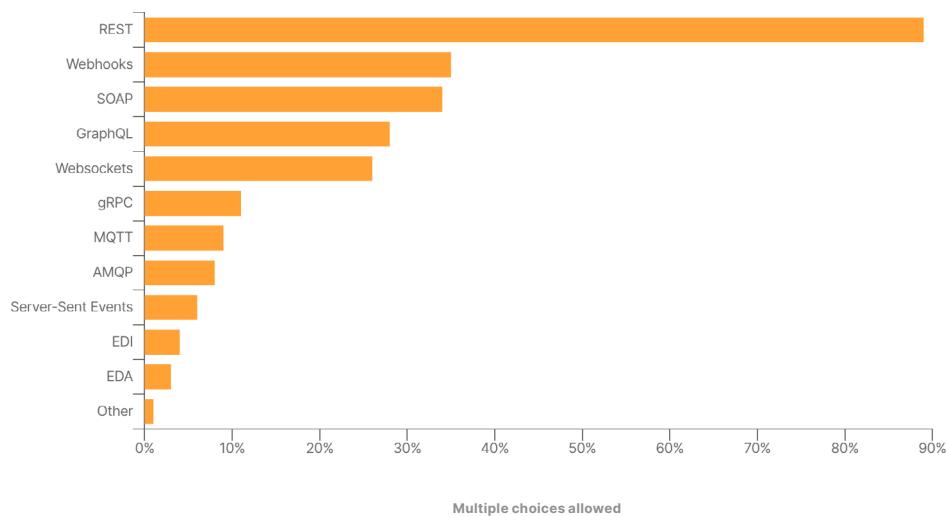


# API Technologies

---

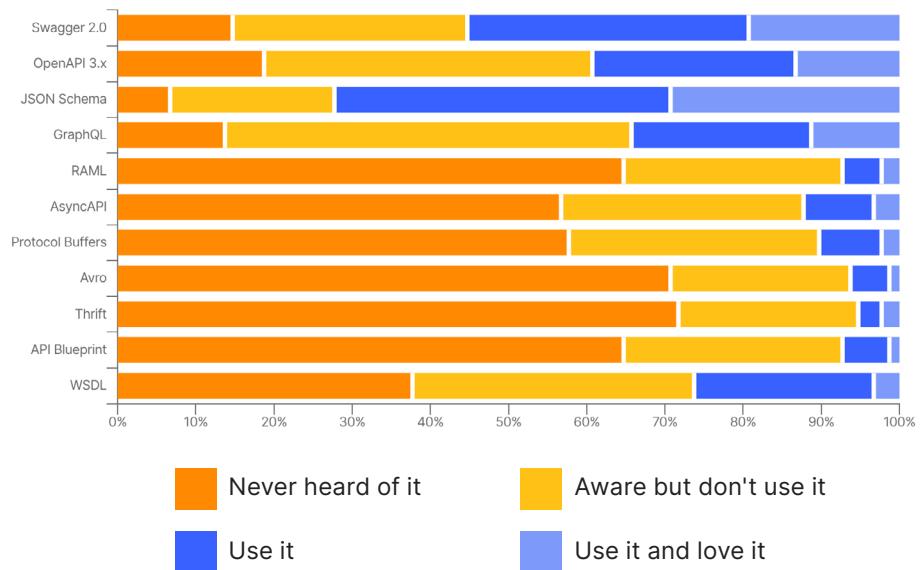
## Architectural style

While REST remains the most-used API architecture by far, it lost a bit of ground to newcomers. Some 89% of survey takers selected it, down from 92% last year. Gaining popularity this year were Webhooks (35% versus 33% last year), GraphQL (28% versus 24%), and gRPC (11% versus 8%). Their growth in popularity comes as gRPC is used for internal microservices and GraphQL for stitching together disparate data sources.



## Specifications

We also asked folks which API specifications they use and love. JSON Schema was by far the most popular choice, used by 72% of respondents. The next most popular were Swagger 2.0 (55%) and OpenAPI 3.x (39%).



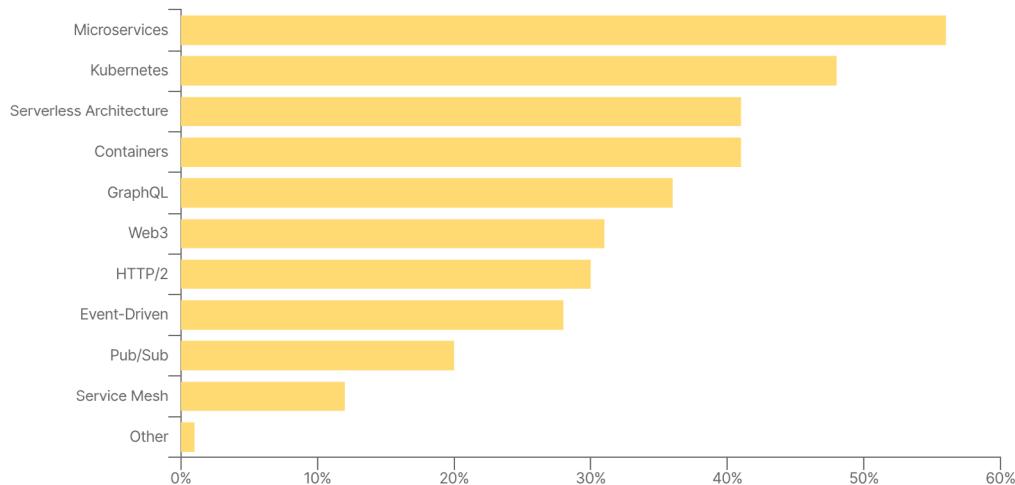
Due to rounding, percentages may not add up to 100%.

## Future technologies

For a third year, respondents were more excited about working with microservices and Kubernetes than any other technology in the coming 12 months.

Participants are also discovering that microservices can bring challenges. As noted elsewhere in this report, about one in four respondents cite proliferation of microservices as an obstacle to consuming and producing APIs.

This year we offered Web3 as a future technology choice. About one in three respondents said they were excited about working with it.



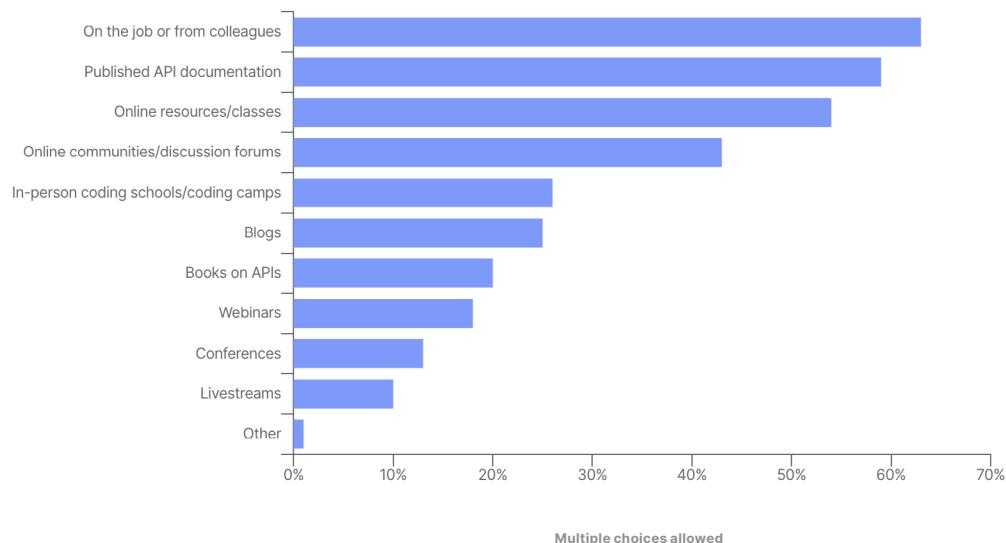
Multiple choices allowed



## Learning about API technologies

We asked survey takers where they gained most of their knowledge about APIs.

The most popular answer was on the job or from coworkers (63%), followed by documentation (59%), and online classes (54%). This ranking held true across generations except for Gen Z (younger than 25), which ranked the three sources as equally popular.



# APIs and the Future of Work



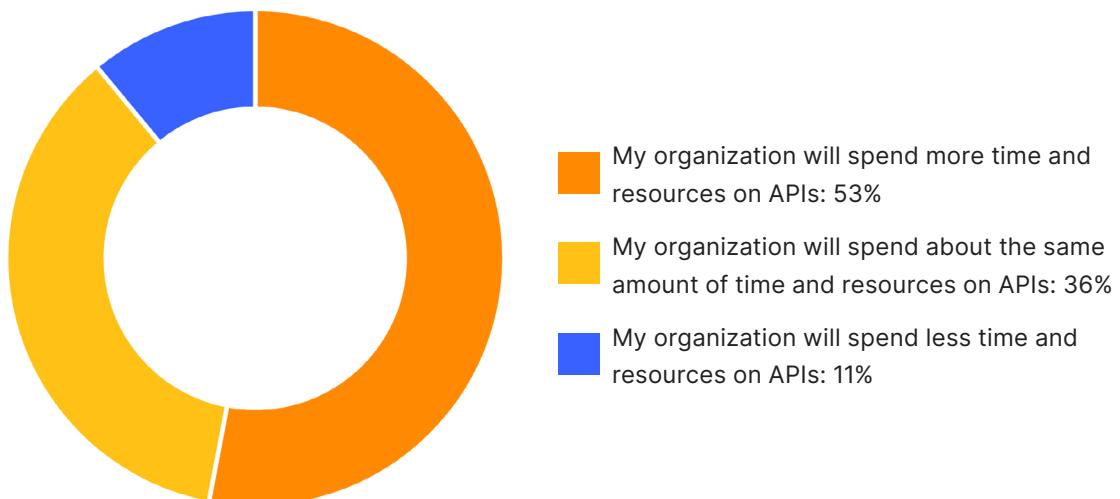
# APIs and the Future of work

---

## API investments to stay robust despite economic headwinds

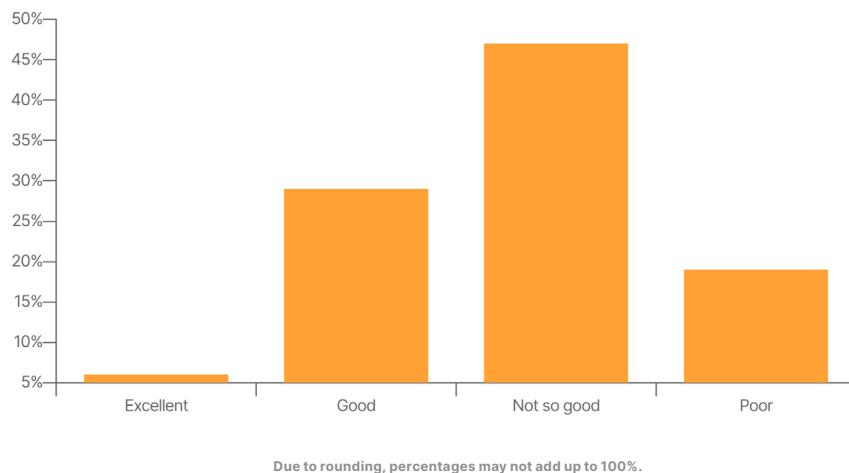
Organizations' investment of time and resources into APIs will increase or stay the same over the next 12 months, said 89% of respondents. This forecast comes even as two out of three respondents globally described the current economy as "not so good" or "poor."

When we polled just executives, a similar level of confidence emerged. Across 1,400 respondents with C-suite titles, 87% of CEOs, 86% of CIOs, and 93% of CTOs predicted API investments would rise or remain steady in the coming year.



## Tech takes dim view of economy

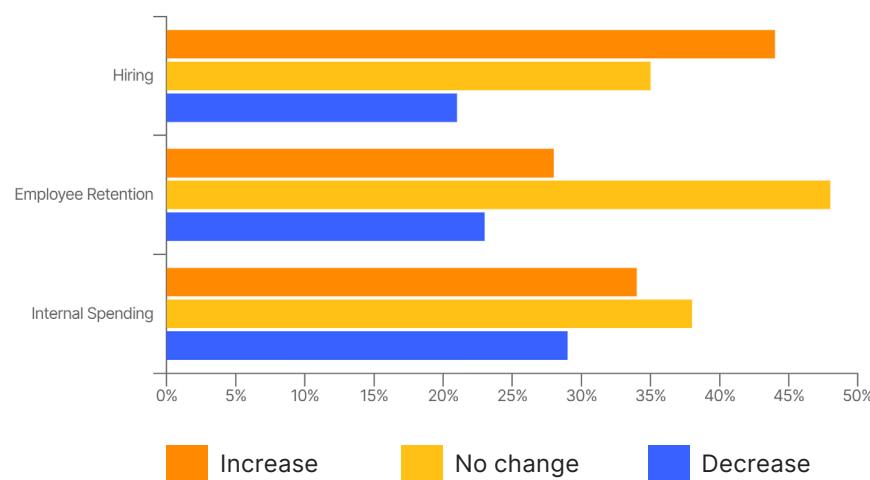
From mid-June to mid-July 2022, we asked API developers and professionals around the globe how they would describe the economy. Some two-thirds called it “not so good” or “poor.” For respondents in the US, their assessment was partially validated when, a few weeks later, the US reported a second straight quarter of economic contraction. Here's how the views broke down from all survey takers:



## API professionals look past economic weakness

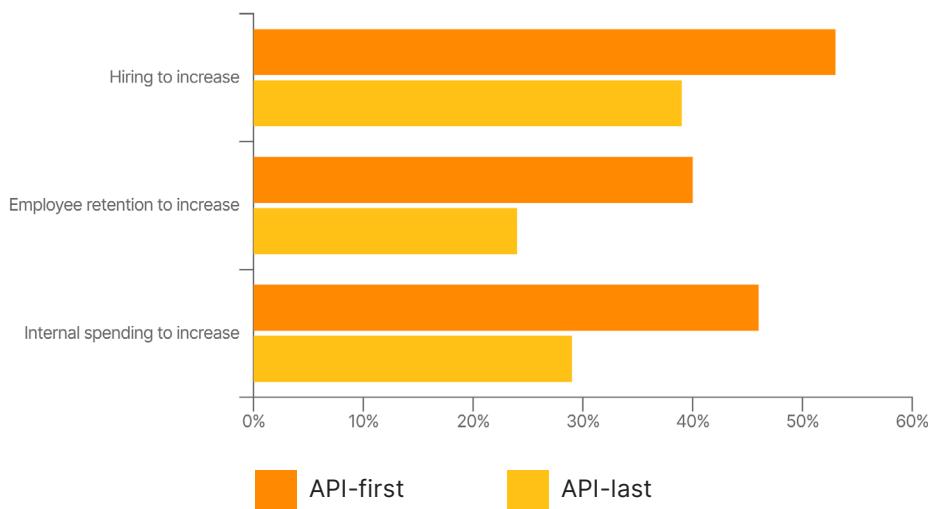
Despite respondents' dour assessment of the economy, they were optimistic about how their own company would fare. We asked: “Given your description of the economy, how would you expect hiring, employee retention, and internal spending to be affected at your organization in the next 12 months?”

More than 70% said they expected all three metrics to increase or stay the same. The sentiment was even brighter at the executive level. At least 76% of CEOs, CIOs, and CTOs predicted hiring, retention, and internal spending would rise or remain steady.



## API-first companies have greater business confidence

Is there a correlation between an API-first approach and an upbeat business outlook? Signs point to yes. API-first leaders were 35% likelier to forecast an increase in hiring over the coming year than respondents ranking themselves lowest in API-first. API-first leaders were also about 50% likelier to predict a rise in employee retention and internal spending.



Due to rounding, percentages may not add up to 100%.

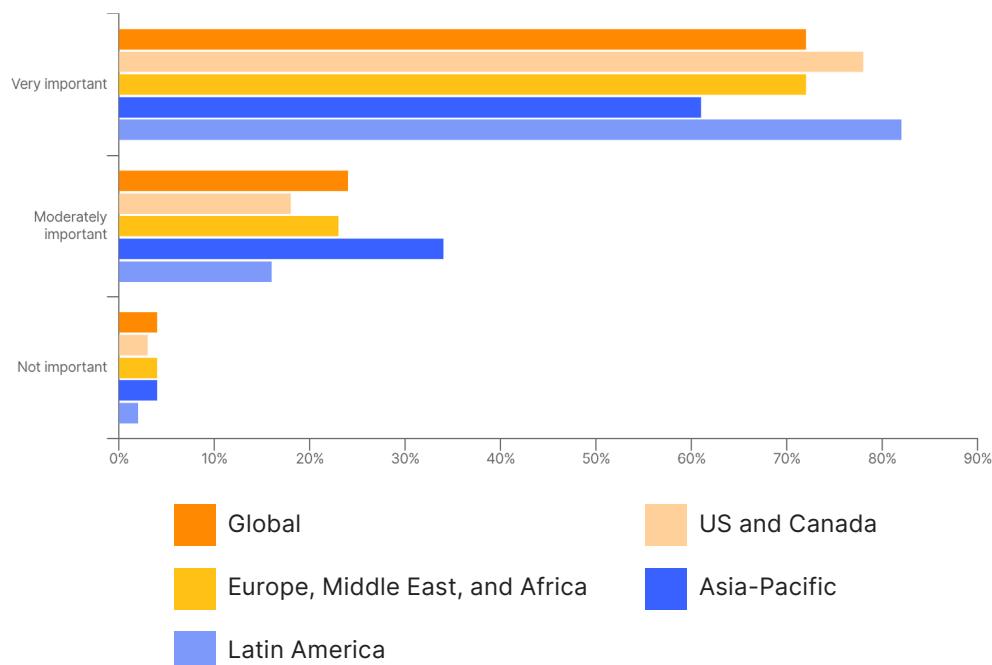


## Remote work is “very important” to a majority of tech sector

Remote work is “very important,” according to 72% of developers and API professionals. The preference for remote work comes as many employers negotiate a return to the office that has encountered resistance.

Across the globe, regions valued remote work differently. Asia-Pacific ranked it the lowest, with just 61% of local respondents calling it “very important.” In Europe, the Middle East, and Africa, 72% of survey takers assigned it that label.

North American respondents were the second-lieliest to call remote work “very important” at 78%. And Latin American respondents prized remote work the most, at 82%.

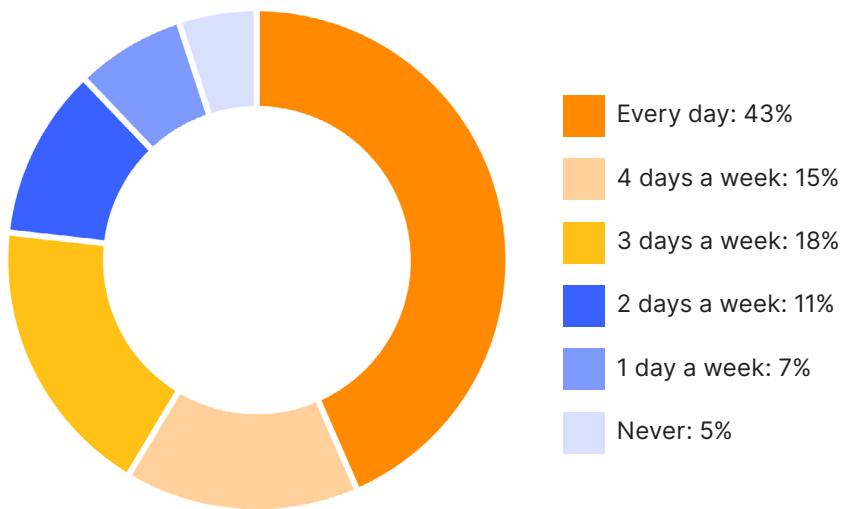


Due to rounding, percentages may not add up to 100%.



## Many expect to work from home every day

In a given work week, how often do tech professionals expect to work from home in the coming 12 months? Globally, some 43% of respondents said they anticipate working remotely every day. A further 15% expected to work from home four days a week. Only 5% of survey takers anticipated no remote work.



Due to rounding, percentages may not add up to 100%.



# Methodology



# Methodology

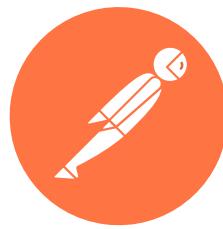
---

This report is based on two sources: a survey of 37,332 developers and API professionals from around the world and anonymized, aggregated data from the Postman API Platform. The survey was fielded over approximately four weeks in June and July 2022. The average amount of time spent on the survey was 15 minutes and 8 seconds. The answers to most nonnumerical questions were randomized in order to prevent order bias in answering.

Respondents were recruited primarily through channels owned by Postman, including social media, email, and the Postman community forum. Since respondents were recruited in this way, highly engaged users of Postman were more likely to notice the survey and complete it.

As an incentive, respondents who finished the survey could opt to receive a copy of this report. Also, individuals from eligible geographies were offered a chance to win prizes including one PlayStation®5, five \$100 Amazon gift cards, or ten \$50 gift certificates to the Postman Swag store.





POSTMAN

