2022

Businesses at Work

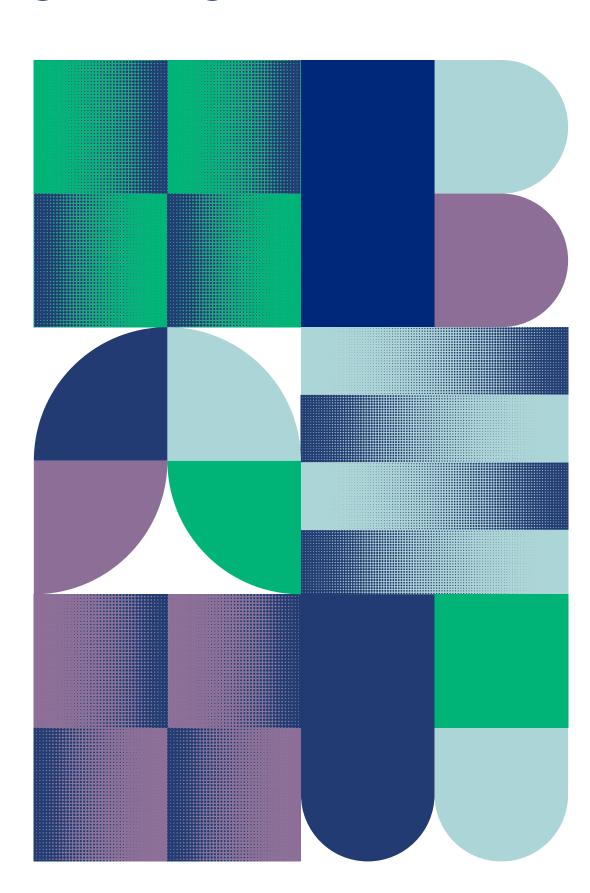Okta, Inc.

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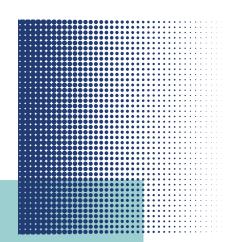
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Welcome to the eighth annual Businesses at Work report, an in-depth look into how organizations and people work today—exploring workforces and customers, and the applications and services they use to be productive.

As the world attempted to turn the corner of the pandemic, companies set out to uncover the magical recipe for "work from anywhere." Solutions that had been temporary stopgap measures during a time of crisis became long-term solutions that fueled better workplace collaboration, clearer communication, and stronger security for teams around the world or across the room—or, increasingly, both.

The data from Okta's more than 14,000 global customers and the **Okta Integration Network**, which includes over 7,000 integrations with cloud, mobile, and web apps, as well as IT infrastructure providers, tells a story of adaptability and resilience.

Companies are dabbling in multi-cloud environments to get the performance they need. They are leaning heavily into productivity suites like Google Workspace (now the third most popular app), and they increasingly add best-of-breed functionality. Organizations are choosing collaboration tools like the fast-growing app Notion, security solutions such as Netskope, and scheduling software like Calendly. They're even leveraging travel apps such as TripActions to connect their teams as some employees make their way back into offices and in-person meetings. Developers are arming themselves with top tools, putting more focus on the long-tail of development, with increased attention to security and capacity. Organizations are protecting their workforces and their customers with stronger factors, and moving away from weaker ones. And while we all know **Zero Trust** is the buzzword du jour, companies, industries, and regions are at different stages of deployment. So, when it comes to security, where are hackers training their sights? *(Hint: It rhymes with schmegacy.)*

Hold onto your seats—this wild ride is getting even more exciting.

Summary of key findings

Apps at work: 2021's most popular apps

- Collaboration and security tools are the two most popular categories of tools deployed through the Okta Integration Network. Meanwhile, categories that support remote work are the fastest growing: design software (39% year-over-year growth), electronic signature tools (38%), and cloud platforms (34%).
- Google Workspace has claimed the title of the third most popular app, with 38% year-over-year growth.
- Collaboration power trio Google Workspace, Zoom, and Slack have won a large number of new customers across Asia-Pacific (APAC) and Europe, the Middle East, and Africa (EMEA), as well as among small businesses. *Highlights:* Google Workspace grew 68% year over year in APAC; and in EMEA, Slack and Zoom grew 49% and 45%, respectively.
- The tech industry ranks Amazon Web Services (AWS) and Google Workspace as its two most popular apps.
- Companies and individuals are enthusiastic about giving back: The number of companies deploying at least one App for Good has grown 36% year over year, and the number of active, unique users assigned to Apps for Good has now reached over 1.2 million.

See more data

Fastest-growing apps

- Seven out of the top 10 fastest-growing apps are brand new to the ranks: Notion, TripActions, Postman, Keeper, Airtable, Fivetran, and Gong.
- For the first time ever, five different collaboration tools made the list: Notion, Figma, Miro, Airtable, and monday.com.
- In EMEA, DocuSign and GitHub are the fastest-growing apps; in APAC, Google Workspace and Zoom.
- Fastest-growing apps vary wildly by industry: tech leans into Notion and TripActions; finance and banking, DigiCert and Envoy; nonprofits, Instagram and SurveyMonkey; and retail, GitHub.
- Highly-regulated sectors, such as government, insurance, finance and banking, and healthcare and pharmaceuticals, are turning to Okta for identity services to protect their end users. *Biggest jump:* a 125% year-over-year growth of government-sector customers for identity products to protect end users.

See more data

Summary of key findings

The best tools for the job

- The average number of apps organizations deploy increased from 88 to 89 this year, contributing to an increase of 24% since 2016.
- Larger companies (2,000 employees or more) deploy more apps: 187 on average.
- The days of being a loyal, one-vendor shop are gone. Among Okta customers deploying Microsoft 365:
    - 45% also deploy Zoom.
    - 33% also deploy Slack.
    - 38% also deploy Google Workspace, up from 36% in 2020.

See more data

The rise of multi-cloud

- The runaway favorite cloud platform is AWS, which grew 32% year over year and claims more than six times as many Okta customers than second-place Microsoft Azure and third-place Google Cloud Platform (GCP) grew 40% year over year.
- Terraform Cloud by HashiCorp burst onto the scene and is quickly climbing the ranks: In the past six months, this eighth-ranked platform has grown 70%!
- 14% of Okta customers deploying a cloud platform have in fact deployed two or more—a number that has increased significantly from 8% in 2017.
- The clear "best couple" in cloud platform pairings is AWS and GCP. Among customers deploying more than one cloud platform through Okta, 2.6% deploy both AWS and GCP—an increase from 1.2% three years ago. In contrast, the combination of AWS plus Microsoft Azure is on the decline.

See more data

Summary of key findings

Supporting dynamic work

- Workday remains the top-ranked human resources (HR) tool; but second-place BambooHR has seen 40% growth over the past year and is the #1 HR tool in EMEA, and APAC, and among tech customers.
- Employee-engagement tools are hot again this year: Lattice (up three spots) boasts 72% year-over-year growth, and Culture Amp is close behind with 56%.
- The number of users accessing integrated workplace-management tools such as OfficeSpace and Envoy dropped almost 70% during the spring of 2020, but now is approaching or exceeding pre-pandemic levels.
- Remote-access-solution tools continue to gain customers, as they are a first step in the Zero Trust journey. Palo Alto Networks GlobalProtect boasts 42% year-over-year growth since 2020, and 434% since 2018. AWS Client VPN jumped into third place, up four spots with an impressive 190% year-over-year growth.

See more data

Security at work

- Attackers are targeting accounts using Legacy Authentication to Microsoft 365 at rates 10 or more times higher than accounts using modern authentication protocols, depending on the industry. On average across all industries, organizations using Microsoft Legacy Authentication face a 53 times higher ratio of threats to authentications. For the government sector, that number is 104 times higher.
- There is at least a 90% reduction in the ratio of threats to authentications when an organization denies access using Legacy Authentication in access policies, depending on the industry. It can be as high as 99%.
- Among all customers authenticating with a factor, WebAuthn has risen from 2% in 2019 to 16% in 2021, and 27% among workforce identity customers in the tech sector.
- 47% of workforce customers deploy SMS and voice factors (down from 53% in 2018), and only 12% deploy security questions (down from 18% in 2018).
- Among organizations deploying identity access to their end users, there has been a sharp decline in the number deploying only one factor, from 58% in 2018 to 39% today.
- We see an increase in the number of customers putting Zero Trust building blocks in place:
    - 31% increase in customers deploying WebAuthn.
    - 9% increase in device trust configuration.
    - 91% increase in risk-based policies.

See more data

Summary of key findings

App development matures

- This year's data suggests that developers are expanding their scope: Monitoring and visibility are becoming just as critical as development itself.
- Monitoring system Sentry reports an impressive 68% year-over-year growth.
- When it comes to software development kits (SDKs), JavaScript is by far the most popular tool, deployed by 77% of Okta customers. This is primarily driven by the use of React and its open source support.
- Go is used by 19% of customers using SDK tools, enough to hold its second-place spot ahead of Java and C#.

See more data

Methodology: how did Okta create this report?

To create our **Businesses at Work reports**, we rely on data from Okta customers. We anonymize Okta customer data from our network of thousands of companies, applications, and IT infrastructure integrations, as well as millions of daily authentications and verifications from countries around the world. Our customers and their employees, contractors, partners, and customers use Okta to log in to devices, websites, apps, and services, and leverage security features to protect their sensitive data. They span every major industry and vary in size, from small businesses to some of the world's largest organizations, with hundreds of thousands of employees or millions of customers.

As you read this report, keep in mind that this data is only representative of Okta's customers, the applications and integrations we connect to through the Okta Integration Network, and the ways in which users access these tools through our service. The terms "app" and "tool" are used throughout this report to refer to applications, services, and integrations that are available through the Okta Integration Network. The trends we describe for Okta's Microsoft 365 customers may differ from those Microsoft 365 customers who do not use Okta (i.e., those using Azure Active Directory or other identity platforms that do not provide strong cross-app integration support).

Each year, we look at app popularity in three different ways. Most charts present the number of customers with an app deployed. A few charts look at the number of active unique users, defined as users who have logged in to an app via Okta at least one time in the past 30 days. In our Apps for Good section, we count users assigned, which are defined as users who have access to the application.

We have worked carefully to standardize our data. Unless otherwise noted, this report presents and analyzes data from November 1, 2020, to October 31, 2021, which we refer to as "this year," "today," and "in 2021." Similarly, when we refer to "last year" or "in 2020," we are referring to data from November 1, 2019, to October 31, 2020. "2019" refers to the same period in its respective year. When referring to company size, Okta uses the term "small" to refer to companies with 1,999 or fewer employees, and "large" to refer to companies with 2,000 or more employees.

We use the term "workforce identity customers" to signify Okta customers who are deploying Okta services to their employees. We use the term "customer identity and access management (CIAM)" to signify Okta customers who are deploying Okta services to their own customers. Okta also offers mixed products that allow workforce and CIAM use cases in the same environment. These products are excluded when we discuss workforce identity and CIAM in isolation.

Unless otherwise specified, the data included in this report is limited to Okta customers that have deployed at least one app to users through the Okta Integration Network. Also, unless otherwise noted, this report looks at apps deployed for corporate use. This year, our report includes data only from Okta, not Auth0.
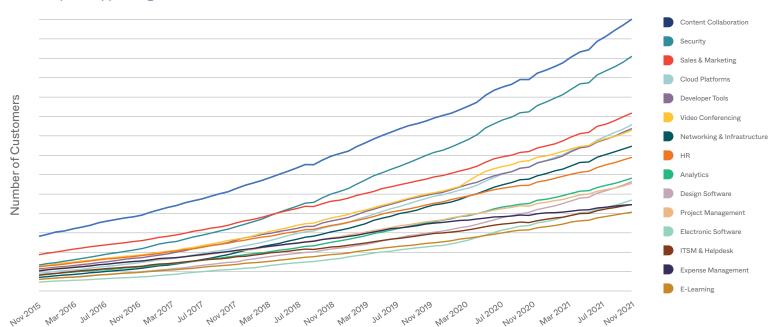
Apps at work: 2021's most popular apps

Absence may make the heart grow fonder, but apps can bring people back together—both virtually and in the "real world," as some companies bring employees back on site.

Collaboration apps and security tools lead the pack as the two most popular categories of tools deployed. We also see strong growth from other categories that support remote work, including cloud platforms, design software, and electronic signature tools.

At the app level, collaboration tools rank heavily in our top app rankings whether we are slicing the data by number of customers, by number of users, by industry, by region, or by company size. Speaking of regions and company size, this year we're seeing very notable growth from a certain collaboration power trio: **Google Workspace**, **Zoom**, and **Slack** have won over a large number of new customers across APAC and EMEA. These tools rank higher and are growing especially rapidly among small businesses globally. *Tech tidbit:* tech organizations have been especially fond of AWS and Google Workspace, ranking them as their #1 and #2 most popular tools, respectively.

With everything we've been through in the past few years, both companies and individuals are enthusiastic about giving back: We've seen huge growth among the number of active unique users assigned to Apps for Good, now reaching over 1.2 million.

Most Popular App Categories

Note: In this view of app usage, we count the number of customers deploying one or more apps or tools in each category.

Apps at work: 2021's most popular apps

No matter the size of a company, where it's headquartered, or its mission and vision, all organizations have two basic needs to survive in today's world: employees must be able to collaborate regardless of their physical location, and companies need to keep their assets secure.

So it's no surprise to see that companies have consistently invested in content collaboration apps and security tools over the years. Content collaboration—which includes productivity suites such as **Microsoft 365** and Google Workspace, as well as apps such as Slack, **Box**, **Dropbox**, and **Atlassian Confluence**—has owned the top rank consistently. Security—a broad collection ranging from people-centric tools like **KnowBe4** and **LastPass** to device-centric **Jamf Pro** to network-centric **Palo Alto Networks GlobalProtect** to infrastructure-centric **Cloudflare**—has held onto second place since June 2018. Both categories saw a bump during the pandemic: In one month, from April 30, 2020, to May 31, 2020, the number of companies deploying content collaboration apps and security tools each grew by 4%. Both categories continue their hot streaks this year, with 28% year-over-year growth for content collaboration and 31% for security tools. Collaboration apps and security tools make an impressive showing in our **fastest-growing apps**, as well. And as goes the Okta Integration Network, so goes the world.

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> At Takeda, offering the highest possible level of biopharmaceutical expertise across 80 countries is our top priority, and has become even more critical during these turbulent times. Enabling our employees—regardless of where they are—with a growing set of collaboration tools has been instrumental to helping them continue to provide care for our clients.
>
> Bob Durfee
> Head of DevSecOps, Takeda Pharmaceuticals
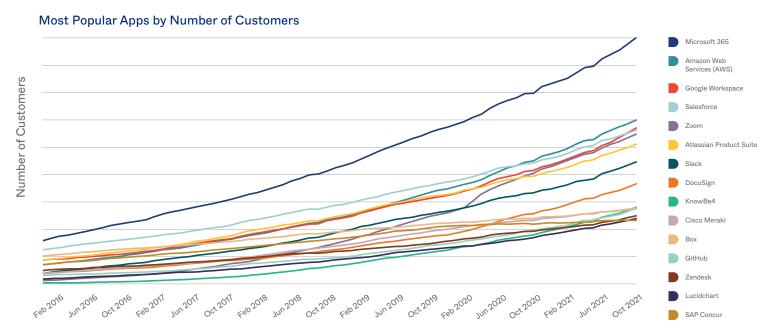
Apps at work: 2021's most popular apps

As more and more collaboration is done remotely, companies are expanding their cloud presence. The number of companies integrating more than one Infrastructure as a Service (IaaS) provider with Okta grew an impressive 34% year over year—the largest growth we've ever seen for that category. (How many cloud platforms are organizations deploying, exactly? We dig into that in our **multi-cloud** section.) We also see a 31% year-over-year increase in companies deploying developer tools as organizations continue to accelerate digital transformation initiatives.

Where do we see the highest rates of growth? Companies added new functionality they simply didn't need pre-pandemic, back when people could slide a piece of paper across a desk to a colleague. In particular, electronic signature and design software apps stand out, each boasting a whopping 38% and 39% respective increase from their 2020 levels as more companies introduced these capabilities.

And what about video conferencing, the darling of the pandemic—a category which grew 14% between February and May 2020 alone? In 2020, video conferencing ranked fourth, as it generally had for years. The category still enjoyed 23% year-over-year growth this year, but in terms of rank, it cooled from fourth to sixth place, surpassed by cloud platforms and developer tools on even hotter streaks.

Now that we've looked at categorical use, let's dig into the data to see the distinct apps, tools, and platforms companies are deploying to keep their workforces humming and secure.

App-etite for collaboration: Google Workspace claims third

Most Popular Apps by Number of Customers

Note: The Atlassian Product Suite includes Confluence, Jira, Trello, and Bitbucket, which are frequently accessed together via a subscription to Atlassian Access.

Apps at work: 2021's most popular apps

We've seen that many popular app categories are collaboration driven, so let's double click on the data to see who actually wins spots on the podium.

Breaking news: Google Workspace has taken the bronze as the third most popular app, with an impressive rally of 38% year-over-year growth! (Google, you'll want to pick up some air mail stamps for those thank-you cards: growth in EMEA and APAC were the major drivers pushing Google Workspace into third place this year.) Microsoft 365 and Amazon Web Services (AWS) continue to hold gold and silver, respectively, with **Salesforce** and Zoom rounding out the top five.

Our most popular apps are so hot that nine out of 15 grew their Okta customer base by 30% or more year over year. High in the ranks where thinner oxygen makes it more difficult to maintain strong year-over-year growth, AWS grew 33%, Zoom grew 36%, the Atlassian Product Suite grew 30%, and Slack grew 34%. (Stick with us and you'll see power trio Google Workspace, Zoom, and Slack pop up as fastest growing from many angles.)

Other upwardly mobile apps of note include electronic signature tool **DocuSign** (up 43% year over year), security training platform KnowBe4 (up a jaw-dropping five notches, and 56%—the largest year-over-year growth from our top 15 most popular apps), developer tool **GitHub** (up 41%), and diagramming and wireframing tool **Lucidchart** (also up 41%, and up one spot). KnowBe4 was consistently a fastest-growing app between 2017 and 2019, for those keeping track at home.

Sifting the data by industry shows several interesting field-specific trends:

- AWS is the most popular tool in the tech sector, a mantle it has held since June 2019. Google Workspace has locked in second place among tech companies since May 2021. (See sidebar for more deets on tech).
- Among the tech sector, we still see strong year-over-year growth from that collaboration power trio we mentioned: Google Workspace at 32%, Zoom at 33%, and Slack at 34%.
- Zoom's legendary popularity is even more pronounced in the healthcare and pharmaceuticals, finance and banking, education, and nonprofit sectors, where it ranks as the third most popular app.
- The Atlassian Product Suite takes the #2 spot in the retail industry, likely thanks to brands building apps to better serve customers shopping from home.
- DocuSign joins the top 5 in finance and banking, as a socially distanced world seeks to expand its secure remote document signing capabilities.
- Box makes the top 5 among nonprofits, boosting remote teams' ability to collaborate and share files together online.
- Slack ranks among the top 5 for retail and nonprofits.

Apps at work: 2021's most popular apps

Tech sector prefers AWS and Google Workspace

Most Popular Apps by Number of Customers, among Tech Sector

Technology
aws
Google Workspace
Microsoft 365
ATLASSIAN
salesforce

Big or small, something for all: most popular apps by customer size

For the first time, we look at our most popular apps filtered by company size. Larger organizations (those with 2,000 or more employees) are more likely to deploy Salesforce, Atlassian, DocuSign, and Box than smaller companies (those with under 2,000 employees). And the biggest difference in ranks? Larger companies rank **SAP Concur** seven spots higher than smaller companies.

Smaller organizations are more likely to have Google Workspace and Slack (both ranked three spots higher for smaller organizations), Zoom (two spots higher), and KnowBe4 (four spots higher).

Think globally, win locally: top apps by region

Most Popular Apps by Region

▲ HIGHER RANK THAN GLOBAL   ▼ LOWER RANK THAN GLOBAL

	GLOBAL	N. AMER.	EMEA	APAC
1	Microsoft 365	Microsoft 365	Microsoft 365	Microsoft 365
2	AWS	Salesforce ▲	AWS	AWS
3	Google Workspace	AWS ▼	Google Workspace	Google Workspace
4	Salesforce	Zoom ▲	Atlassian Product Suite ▲	Atlassian Product Suite ▲
5	Zoom	Google Workspace ▼	Salesforce ▼	Salesforce ▼
6	Atlassian Product Suite	Atlassian Product Suite	Slack ▲	Zoom ▼
7	Slack	Slack	Zoom ▼	Slack
8	DocuSign	DocuSign	DocuSign	GitHub ▲
9	KnowBe4	KnowBe4	GitHub ▲	DocuSign ▼
10	Cisco Meraki	Box ▲	Zendesk ▲	Zendesk ▲
11	Box	Cisco Meraki ▼	Cisco Meraki ▼	Box
12	GitHub	GitHub	Jamf Pro ▲	PANW GlobalProtect ▲
13	Zendesk	SAP Concur ▲	BambooHR ▲	ServiceNow ▲
14	Lucidchart	Lucidchart ▲	Lucidchart	Mimecast ▲
15	SAP Concur	Zendesk ▼	Tableau ▲	Xero ▲

Apps at work: 2021's most popular apps

What apps does Siberia use for remote work? What cloud apps can be seen in the Himalayas? Some of the most recognized tech names in the U.S. are just as popular around the world. But a deeper dive into regional data yields some interesting insights into how EMEA, APAC, and North America have different software needs and preferences.

Google Workspace's impressive 38% year-over-year growth—which pushed it up into the third place ranking worldwide—was largely due to its regional dominance among customers in APAC and EMEA, where it saw a whopping 68% and 43% year-over-year growth, respectively. This echoes last year's dramatic rise of AWS to second place, similarly driven by rapid growth in EMEA and APAC.

It seems we can't mention Google Workspace this year without Zoom and Slack. Although Zoom's SpaceX-like growth trajectory in the U.S. tailed off a little in 2021 as the pandemic wore on, the video conferencing juggernaut is still rocketing skyward with international customers, boasting 37% year-over-year growth in APAC and 45%
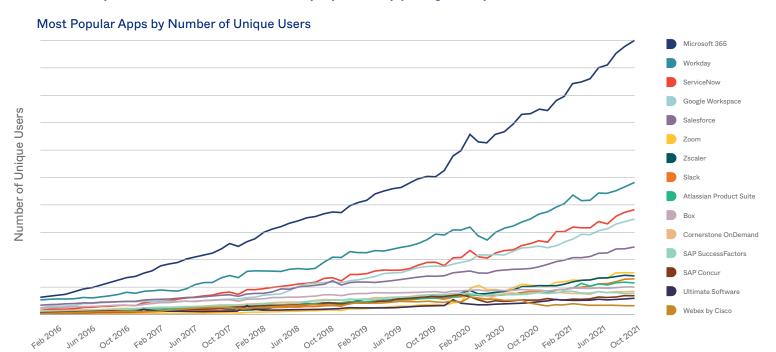
Apps at work: 2021's most popular apps

in EMEA. North America drives Zoom's high global rank, where the app is now closing in on AWS' third-place position. Is it possible Zoom could become a top 3 app in North America in 2022? Tune in this time next year to find out!

Collaboration maven Slack is also expanding its customer base dramatically outside of North America, showing 40% year-over-year growth in APAC and 49% year-over-year growth in EMEA.

Other notable highlights on our world tour:

- The Atlassian Product Suite, software development app GitHub, and customer service suite **Zendesk** all rank higher in EMEA and APAC than they do in North America.
- On the other side of the coin, KnowBe4 currently shows up only in the rankings for North America.
- Four apps' high popularity is specific to APAC: network security tool Palo Alto Networks GlobalProtect (which hopped up one spot from 2020), workflow platform ServiceNow, email security tool **Mimecast**, and small business accounting software Xero.
- Similarly, there are three apps that have (so far) earned top popularity honors only in EMEA: mobile device management tool Jamf Pro, HR service BambooHR, and data visualization software **Tableau**.
- BambooHR and Tableau in particular are new to the most popular apps by region in this year's report.

Stand up and be counted: most popular apps by unique users

Most Popular Apps by Number of Unique Users

Legend:
- Microsoft 365
- Workday
- ServiceNow
- Google Workspace
- Salesforce
- Zoom
- Zscaler
- Slack
- Atlassian Product Suite
- Box
- Cornerstone OnDemand
- SAP SuccessFactors
- SAP Concur
- Ultimate Software
- Webex by Cisco

Apps at work: 2021's most popular apps

Like snowflakes and fingerprints, each individual user is truly unique. When we sort app usage by unique users, we get a closer look at which apps enjoy new or enduring broad-based popularity.

The biggest story in unique-user popularity is a dynamic duo: Slack and Salesforce. After **acquiring Slack** in July of this year, Salesforce Chair and CEO Marc Benioff promised they would create "the digital HQ that enables every organization to deliver customer and employee success from anywhere." Well, the data is in: Slack's number of unique users leapt 54% year over year, while Salesforce was right on their heels with 46% growth.

This rebuilding-the-economy year shows impressive growth in the number of unique users across many different sectors. At the top of the chart, Microsoft 365 saw 36% year-over-year growth, HR tool **Workday** saw 38%, and ServiceNow, a very strong 48%. The Atlassian Product Suite increased its unique user base by 44% as developers were heads-down addressing new customer needs. Meanwhile, Zoom clocked in at an impressive 42% increase year over year, even after its jaw-dropping 195% growth in 2020.

We call it the 'Covid correction'—brands that initially dipped during the pandemic but are now getting back to business. As remote workers hone new skills, **Cornerstone OnDemand**, which dipped during the early pandemic months, has seen 21% growth since February 29, 2020. And now that work travel is slowly but finally coming back, SAP Concur returns to near its 2019 levels. (But it had better watch out for second-fastest-growing app **TripActions**, ready to nip at its suitcase wheels.)

Tech tidbit: Google Workspace boasts the largest number of unique users among tech customers, growing 44% year over year, with a surging Salesforce in second place.

Apps at work: 2021's most popular apps

Apps that are helping people change the world

Most Popular Charitable Giving Apps by Number of Users Assigned			
1	benevity	2	YourCause® from Blackbaud
3	Bright Funds	4	good2give
5	VolunteerMatch	6	catalyser
7	millie	8	kindlink
9	CareerVillage	10	visit.ORG

Note: Data includes both personal and corporate apps.

With so many social and economic challenges around us these days, more and more people are driven to donate money or volunteer their time to make their communities and the world a better place. Giving USA publishes an **Annual Report on Philanthropy** that reports that Americans gave a record $471 billion in 2020 (counting combined individual donations, corporate donations, bequests, and foundation giving), which equates to more than $1.29 billion per day. Companies are stepping up to support their employees' desires to engage with causes they care about as well: We see 36% year-over-year growth in the number of companies deploying at least one App for Good through the Okta Integration Network.

This year we see a pronounced increase in the number of users assigned to Apps for Good: This includes users assigned at the organizational level, as well as individuals who chose to add the apps to their own dashboard. More than 1.2 million Okta users have been assigned to these apps—a 29% increase since last year. The top 5 apps each boast more than 10,000 assigned users!

Apps at work: 2021's most popular apps

The top performer is Calgary-based **Benevity**, which offers charitable donation management and grant-management platforms. Benevity enjoyed a 40% increase in the number of assigned users since 2020 and a 173% increase since 2018. **Bright Funds**, a platform for workplace giving, volunteerism, and grant management, boasts 74% more assigned users this year than in 2020. The fourth most popular app is **Good2Give**, a community investment and giving platform that grew 129% year over year. **Catalyser**, which allows organizations to manage and grow employee giving, volunteering, fundraising, and pro bono work, showed the strongest growth with an impressive 189% increase in assigned users year over year. Learn more about why and how companies are deploying Apps for Good in our blog series on **social impact in the workplace**.
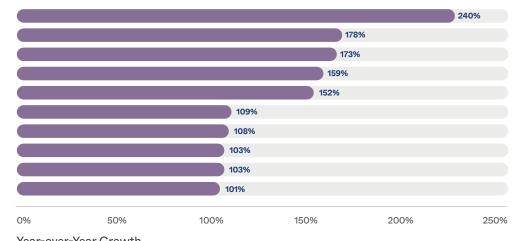
Fastest-growing apps

New app, who dis?
The fastest-growing apps

Our annual list of the fastest-growing apps is a veritable Who's Who of promising up-and-comers. This year is no exception: 70% are brand new to the ranks, including **Notion**, TripActions, **Postman**, **Keeper**, **Airtable**, **Fivetran**, and **Gong**. And three returning fastest growers are still building on incredible growth: **Miro** (which boasted 301% year-over-year growth in 2020), **Figma** (236% year-over-year growth in 2020), and **monday.com** (149% year-over-year growth in 2020).

Fastest-Growing Apps by Number of Customers

App	Year-over-Year Growth
Notion	240%
TripActions	178%
Postman	173%
Figma	159%
Miro	152%
Keeper	109%
Airtable	108%
Fivetran	103%
monday.com	103%
Gong	101%

Year-over-Year Growth
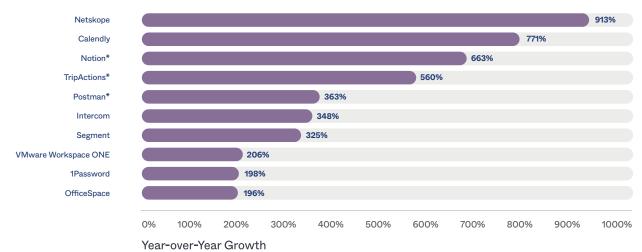
Although content collaboration tools were almost completely absent from the fastest-growing list from 2017 to 2019, pandemic-driven remote work has made these apps outright essential. For the first time ever, five different collaboration tools make the list: Notion, Figma, Miro, Airtable, and monday.com. But our list has something for everyone. This is the first time a sales tool (Gong) has reached the top ranks of fastest-growing apps. Other top apps represent corporate travel and spend management (TripActions), developer tools (Postman), security (Keeper), and data analytics (Fivetran).

How hot are these apps? The combined value of the top 5 fastest growing, all of which boast more than 150% growth year over year, is over $33 billion-with-a-B. Top-ranked Notion **was valued** at $10 billion in October 2021, the same **valuation** as Figma. TripActions was **valued at $7.25B** in January 2021, and Postman was **valued at $5.6B** in August 2021. The list of fastest-growing apps has some bell-ringing IPOs in its future!

Fastest-Growing Apps by Unique Users

App	Growth
Netskope	913%
Calendly	771%
Notion*	663%
TripActions*	560%
Postman*	363%
Intercom	348%
Segment	325%
VMware Workspace ONE	206%
1Password	198%
OfficeSpace	196%

0%   100%   200%   300%   400%   500%   600%   700%   800%   900%   1000%

Year-over-Year Growth

* App is also one of the fastest-growing by number of customers.

Fastest-growing apps

Looking at the fastest-growing apps by number of unique users, we see an eye-popping year-over-year gain of 913% in unique users accessing cloud-native security solution **Netskope**; Okta and Netskope worked together closely to enhance system connections to meet increased demand from the shift to remote work. **Calendly**, a modern scheduling platform which raised **$350 million for a $3 billion valuation** this year, boasts a 771% year-over-year increase in unique users. Hats off to our crossover winners: the third, fourth, and fifth fastest-growing apps by unique users (Notion, TripActions, and Postman) also grab spots on the list of fastest growing by number of customers. More year-over-year growth worth talking about: customer engagement and support tool **Intercom** garnered 348% growth in unique users since 2020, and developer tool **Twilio Segment**, 325%. We welcome security tools **VMware Workspace ONE** and **1Password**, and integrated workplace management systems (IWMS) OfficeSpace to the ranks as well. (You can see the dramatic shifts in monthly use of **OfficeSpace** and other IWMS tools below.)
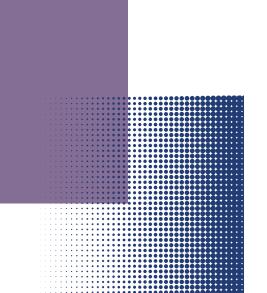
Fastest-growing apps

Winners, by what and where: fastest-growing apps by industry and region

Fastest-Growing Apps, by Region

Region	By Number of Customers		By Unique Users	
N. AMER.	TripActions	**173%**	Calendly	**768%**
EMEA	DocuSign	**70%**	GitHub	**128%**
APAC	Google Workspace	**68%**	Zoom	**231%**

Looking at app use by region, some interesting trends bubble to the surface. In EMEA, the top performers are DocuSign and GitHub. The growth of DocuSign mirrors the sheer volume of new e-transactions, as well as organizations' need for reliable compliance and privacy. According to George Mironescu, senior research manager from IDC, "GitHub's growth comes on the back of a more general push towards software development across Europe, where 35% of organizations surveyed by IDC indicate plans to increase their 2022 investment in software dev and delivery compared to 2021." In APAC, seeing Google Workspace and Zoom at the top reveals that companies are arming employees with collaboration tools. North America shows increasing trends in travel and connection, with top spots going to TripActions and Calendly.

Fastest-growing apps

Fastest-Growing Apps, by Industry

Industry	By Number of Customers		By Unique Users	
Technology	Notion	**250%**	TripActions	**1647%**
Finance & Banking	DigiCert	**70%**	Envoy	**575%**
Nonprofit	Instagram	**47%**	SurveyMonkey	**93%**
Retail	GitHub	**48%**	GitHub	**106%**
Healthcare & Pharma	Salesforce	**51%**	Salesforce	**511%**
Education	Google Workspace	**36%**	Zoom	**36%**
Government	MSFT 365	**33%**	MSFT 365	**75%**

Breaking out our fastest-growing apps by sectors shows us what these industries are prioritizing. The tech sector is focused heavily on collaboration and travel planning: TripActions attracts a 1647% surge in unique users. We note that tech is the only industry prioritizing a travel tool. Finance and banking are focused on digital security, as well as managing visitors or employees as they physically return to offices. (More about workplace management trends **below**.) Nonprofits are building connections with **Instagram** and **SurveyMonkey**. Retail is leaning into app development with GitHub. Healthcare and pharmaceutical companies are overwhelmingly moving to Salesforce. Education is focused on collaboration with Google Workspace and Zoom. The continued growth of Zoom at the unique user level is impressive after **our 2020 Businesses at Work (from Home)** report noted that, among customers in the education sector, on March 23, 2020, Zoom had 1941% growth compared to 28 days prior... and of course Zoom continued to attract users throughout the pandemic. And finally, the government sector reaches for Microsoft 365 for their productivity needs.

Fastest-growing apps

Highly-regulated sectors turn to Okta

Workforce Identity Customers		CIAM Customers	
Nonprofit	**65%**	Government	**125%**
Media & Communication	**38%**	Wholesale Trade	**108%**
Government	**36%**	Insurance	**94%**

Organizations in highly-regulated sectors such as government, insurance, finance and banking, and healthcare and pharmaceuticals are increasingly turning to Okta for identity services to protect their end users. Okta has seen over 125% year-over-year growth in the number of government customers it provides with security for end users, 94% year-over-year growth for insurance, 71% for finance and banking, and 59% for healthcare and pharmaceuticals. Among workforce identity customers, nonprofits, media and communications, and government are adding security more quickly than other sectors.

Some organizations are seeking cyber insurance to mitigate the risks of cyber attacks, data breaches, and business disruption. In order to qualify, certain criteria must be met. Cyber insurance providers were already requiring their customers to implement specific security controls, like end-to-end encryption and anti-phishing awareness, in order to renew and avoid a change in premium and/or coverage. Now, the latest requirement many cyber insurance providers are requiring of their customers is **to implement multi-factor authentication (MFA)**.

In August 2021, the Federal Financial Institutions Examination Council (FFIEC) **issued guidance** that provides financial institutions with examples of effective authentication and access risk management principles and practices. They recognized the importance of the financial institution's risk assessment to determine appropriate access and authentication practices, and they discussed how multi-factor authentication, or controls of equivalent strength, can more effectively mitigate risks.

In EMEA, the transition period to implement **Strong Customer Authentication** under PSD2 closed in December 2020 which drives MFA adoption in the banking space. The UK is taking a similar approach, but **delayed adoption** until 2022.

Consumers increasingly expect the companies they interact with to do more to protect their digital identity and prevent credential-based threats. We expect the 2021 **executive order on cybersecurity** will not only drive identity adoption with government contractors, but will also encourage new security regulations within other industries.

The best tools for the job

App usage: best of breed wins the show

Whether you are a software developer or a surgeon, a marketer or a mechanic, you want the best tools for your job. As companies struggle to retain workers in a fluid marketplace, they are especially motivated to arm their employees with the top tools they need to be competitive: according to the **Adobe Workfront report**, 49% of U.S. workers said they would leave a company if they were frustrated by their workplace tech.

Companies continue to deploy an increasing number of apps and tools, and supplement bundles that aren't meeting their needs. Many organizations still commit to Microsoft 365, but they deploy seemingly "redundant" functionality by adding apps such as Zoom, Slack, and Box. An increasing number double-bundle with Google Workspace as well. The olden days of a company choosing to be a "Microsoft shop" are long gone, as many companies that deploy Microsoft 365 add on advanced functionality from non-Microsoft providers such as AWS and Salesforce.

App usage on the rise: adding better tools to the shed

It makes good business sense to consolidate functionality whenever possible, but as new needs pop up—especially unexpected needs from an unexpected pandemic—organizations need to solve problems quickly. Sometimes a new app is the best solution.

The average number of corporate and personal apps organizations deploy increased from 88 to 89 this year, contributing to an increase of 24% since 2016. Looking at the heaviest app users, 10% of our customers deploy an average of 202 apps each, up from 199 last year.

Larger companies deploy more apps: companies with 2,000 employees or more deploy an average of 187. Companies with under 2,000 employees, by comparison, deploy 72 apps on average, as they typically don't face the same range of needs as larger organizations (at least not yet).

We can also see the growing need for apps over time by looking at our customers' app usage journey. Newer customers tend to initially deploy fewer apps through the Okta Integration Network, then add more over time. Customers who have been with Okta for less than a year adopt an average of 22 apps. In contrast, customers who have been with Okta for four years or more deploy nearly 10 times that, with an average of 210 apps per customer (up from 207 last year). And looking at age and size together: large companies that have been with Okta for more than four years deploy an average of 383 apps, up from 194 in 2017.

The best tools for the job

The data shows distinct differences by region as well: among North American organizations, the average number of apps deployed is 97, while the average is 66 in EMEA, and 56 in APAC.

Note: Data includes Okta Integration Network and non-Okta Integration Network, personal and corporate apps.

Battle of the bundles: Google gobbles greater growth

No matter how you slice the data, the two most popular productivity suites are both growing, but Google is growing faster. Among Okta customers, Google Workspace boasts an incredible 38% increase, while Microsoft 365 shows 29% growth year over year. Sifting by unique users delivers even more impressive results, with an increase of 42% for Google and 36% for Microsoft.

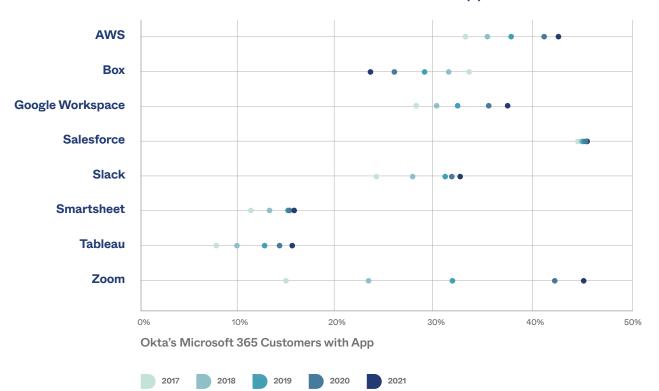|	Microsoft 365	Google Workspace
Year-over-year growth by number of customers	29%	38%
Year-over-year growth by number of unique users	36%	42%

We wondered if small or large companies are driving the growth of these suites. Looking at the increase in Google Workspace adoption, we see that the number of large companies grew 23%, vs 40% for small companies. For Microsoft 365, those numbers were 18% for large companies and 31% for small companies.

The best tools for the job

Friends for Clippy: best-of-breed apps get invited to the party

Even with constrained budgets, organizations are adopting diverse sets of tools in order to best address their employees' productivity needs. By adding best-of-breed apps on top of productivity suites, companies can build a platform that accounts for all their collaboration and security requirements. Tracking this trend over time, it continues to grow as more customers find value in supplementing Microsoft 365. Apps such as Zoom, Slack, and Google Workspace provide cutting-edge functionality and usability that companies increasingly view as table stakes for collaboration.

Okta's Microsoft 365 Customers with Best-of-Breed Apps

Okta's Microsoft 365 Customers with App

2017   2018   2019   2020   2021

Note: Salesforce data for 2017, 2018, 2020, and 2021 are the same at the time of the report. Smartsheet data for 2019 and 2020 are the same at the time of this report.

The best tools for the job

Best-of-breed apps dominate their category for the standalone functionality they provide. We look at the percentage of Okta's customers who deploy Microsoft 365 to see what additional best-of-breed apps round out their dashboards. This includes apps that supplement the basic Microsoft offering (Zoom, Slack, and Box), tools and platforms with enhanced functionality (Salesforce, AWS, Tableau, and Smartsheet), and finally, the ultimate supplement: competing suite Google Workspace. 33% of Okta's Microsoft 365 customers have four or more best-of-breed apps, up from 20% in 2017.

On the collaboration front, Zoom was deployed by 45% of Okta's Microsoft 365 customers as they opted to supplement Microsoft Teams. Popular team communication platform Slack saw a boost in shared customer base with Microsoft 365, up one percentage point from 2020 to 33%. And 24% of Okta's Microsoft 365 customers also deploy Box, a direct competitor to OneDrive.

The days of companies locking in to one vendor for all their tools are long gone. A growing number of companies choose best of breed for advanced functionality as well. 45% of Okta's Microsoft 365 customers deploy Salesforce, 43% choose AWS, 16% opt for Smartsheet, and another 16% use Tableau.

Companies like to get their Google on, as an increasing number pair Microsoft 365 with Google Workspace, a combo that jumped from 36% in 2020 to 38% this year.

When we look at this same data by region, we see a shift to cloud-based collaboration and infrastructure. In EMEA, Okta's Microsoft 365 customers have an even stronger affinity with Google Workspace (41%) than we see globally, as well as AWS (43%). EMEA also sees a big jump in both Zoom (up three points year over year to 35%) and Slack (up three points year over year to 32%).

In APAC, combined use of Microsoft 365 and Google Workspace jumped a whopping seven percentage points to 33%. Looking at longer trends, APAC has shown the largest increase in use of Salesforce since 2016, with a 10-point increase to 40%.

The best tools for the job

"

Organizations today understand that one-size-fits-all software solutions are not sufficient for addressing core productivity and security challenges in the workplace. That's why we see Okta customers increasingly supplement their bundled applications with other industry-leading collaboration tools like Slack, Box, and Zoom.

Diya Jolly
Chief Product Officer, Okta

The rise of multi-cloud

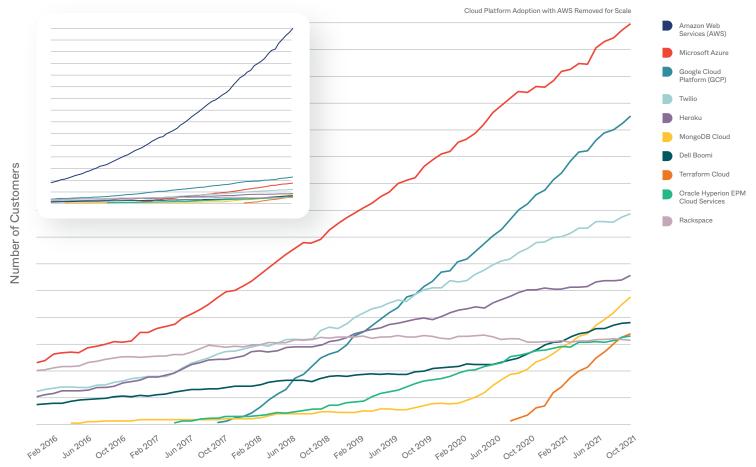## Your computing platform forecast: increasingly cloudy

Businesses have clear visibility around the importance of cloud computing. Being able to access workflows and productivity tools from any location, on any device, was the stretch goal that suddenly turned into a business imperative. And nobody's looking back.

But an interesting trend we've identified is that cloud migration isn't just increasing—it's doubling, and complexifying. While we first called out the trend in our 2019 report, we continue to see more organizations are choosing not to put all their cloud computing in one virtual basket, and are utilizing multiple cloud platforms. Of course, each new adoption requires effort toward a secure and seamless integration.

The 30,000-foot view: AWS is the most common cloud platform by a very large margin, **Google Cloud Platform** (GCP) is growing the fastest, and the combination of those two is the favorite pairing for the increasing number of companies embracing multi-cloud. Here's a deeper dive.

Gold, silver, and bronze linings: the most popular cloud platforms

Most Popular Cloud Platforms as a Service and Administration Tools

Cloud Platform Adoption with AWS Removed for Scale

Legend:
- Amazon Web Services (AWS)
- Microsoft Azure
- Google Cloud Platform (GCP)
- Twilio
- Heroku
- MongoDB Cloud
- Dell Boomi
- Terraform Cloud
- Oracle Hyperion EPM Cloud Services
- Rackspace

Y-axis: Number of Customers

X-axis: Feb 2016, Jun 2016, Oct 2016, Feb 2017, Jun 2017, Oct 2017, Feb 2018, Jun 2018, Oct 2018, Feb 2019, Jun 2019, Oct 2019, Feb 2020, Jun 2020, Oct 2020, Feb 2021, Jun 2021, Oct 2021
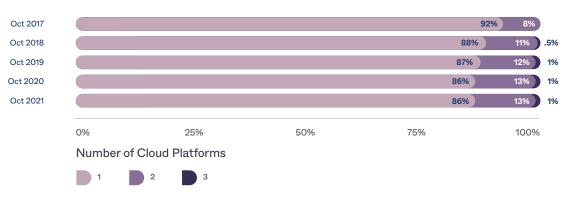
The rise of multi-cloud

AWS remains the runaway favorite cloud platform. Among customers protecting a cloud platform through Okta, AWS enjoyed 32% growth this year, contributing to a total increase of 152% since 2018. This top cloud platform counts more than six times as many customers as its nearest rival, **Microsoft Azure**. In contrast, Azure saw 21% year-over-year growth, and 116% since 2018.

Google Cloud Platform (GCP) is racing to catch up, boasting an increase of 40% since 2020—a whopping 365% from where it ranked in 2018. At their current rate of growth, it may claim the number-two rank in the next few years.

San Francisco-based **Twilio** and **Heroku** and New York's **MongoDB Cloud** round out the field of the six most popular cloud platforms by number of customers. While its trend line is dwarfed by AWS, MongoDB Cloud has actually grown 131% over the past year. And a shout-out to **Terraform Cloud by HashiCorp**, which burst onto the scene and is quickly climbing the ranks: in the past six months, this eighth-ranked platform has grown 70%!

More clouds on the horizon

Customers Deploying a Cloud Platform

Oct 2017	92%	8%	
Oct 2018	88%	11%	.5%
Oct 2019	87%	12%	1%
Oct 2020	86%	13%	1%
Oct 2021	86%	13%	1%

0%   25%   50%   75%   100%

Number of Cloud Platforms

● 1   ● 2   ● 3

As companies move away from legacy and on-premise platforms, the trend toward greater cloud adoption can evolve into a need for more diverse cloud platforms. We see that 40% of our customers integrate at least one cloud platform with Okta, up from 33% in 2017. This year we see that 14% of customers deploying a cloud platform have in fact deployed two or even more—a number that has increased significantly from 8% in 2017.
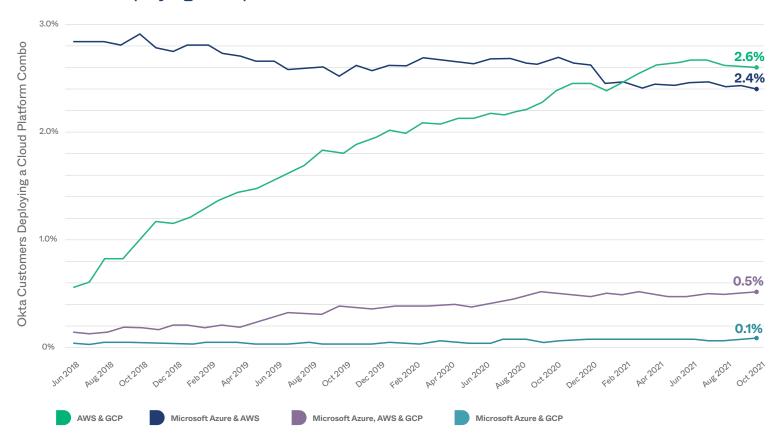
The rise of multi-cloud

Deploying a cloud platform is not a decision to take lightly, so why would a company need more than one? One reason could be the company's cloud computing history: a particular cloud platform might have been the best service offered at one time, but another was later added to fill additional needs, or acquired through a merger. Another is cost efficiency: some software vendors charge less to run their programs in their proprietary cloud environment, and it may make financial sense to utilize that environment in addition to an existing cloud platform. Yet another driver is better support for specific needs: AWS, for instance, has specific capabilities not available from other providers. Still another reason could be "best-of-breed" functionality: GCP is renowned for its Kubernetes and AI service. And finally, some companies find it difficult to move assets to a different provider to consolidate their cloud computing.

Regardless of the motivation, there is a growing segment of companies that increasingly deploys a multi-cloud strategy.

Customers Deploying Multiple Cloud Platforms

Okta Customers Deploying a Cloud Platform Combo

- AWS & GCP — **2.6%**
- Microsoft Azure & AWS — **2.4%**
- Microsoft Azure, AWS & GCP — **0.5%**
- Microsoft Azure & GCP — **0.1%**

The rise of multi-cloud

Among organizations that deploy more than one cloud environment, we see a clear "best couple" in preferred platform pairings. The spotlight at this multi-cloud mixer is focused on… drum roll please… AWS and GCP. Since 2018, the percentage of customers deploying both AWS and GCP solutions has more than doubled, rising from 1.2% to 2.6%.

Despite the overwhelming popularity of AWS, as evidenced in our most popular cloud platforms chart, being paired with AWS is not enough to make every combo a winner. The percentage of companies deploying AWS in addition to Azure actually decreased over the same period, falling from 2.8% in 2018 to 2.4% now, pulling this combo out of the top spot.

Supporting dynamic work

Covid Phase 3: companies are investing more in their people

People are our greatest asset, says every company ever.

When companies first began to respond to the pandemic, they focused on adding technology that could support remote work. As more of our work and life experiences moved online, the second phase of evolution focused on seamless and secure customer experiences.

Now, well into the pandemic, organizations are increasingly focusing on ways to support their employees. This past year, workers got burnt out from working around the clock in their homes and many left their jobs in pursuit of deeper purpose and better work/life balance. As we begin 2022, the U.S. job market is on the upswing, with the unemployment rate falling to a pandemic low and job creation on the rise. With the focus turned to employees, employers are overhauling employee experiences as some return to offices and others choose to stay remote.

The data speaks for itself: companies continue to invest heavily in platforms to support their employees. With many offices remaining closed, organizations doubled down this year on their outreach to remote workforces by deploying more HR tools, and added a new focus on improving employee engagement to better unite geographically scattered teams.
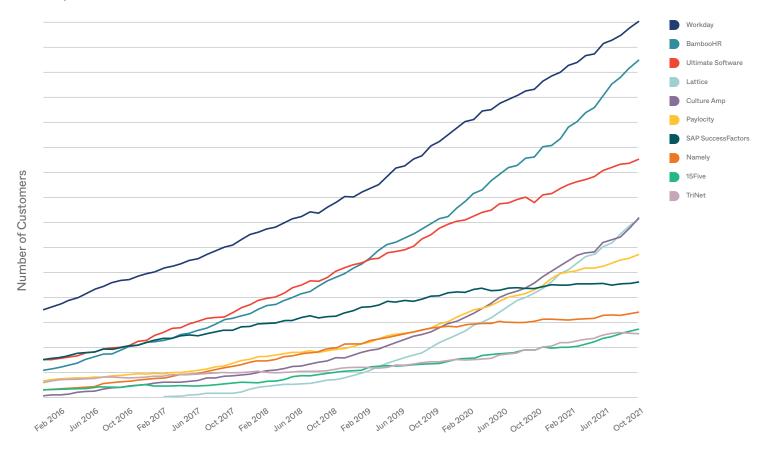
Another trend we see concerns the long-awaited physical return of worker bees back to the hive. Looking at the change in usage at the unique user level for integrated workplace management system tools, we can infer that not all, but many of the employees that left en masse when the pandemic began are beginning to return to the office. And the continued growth of remote access solutions shows us that companies are continuing to support their workforces for times they need to, or choose to, work remotely.

Let's get engaged: the most popular HR tools

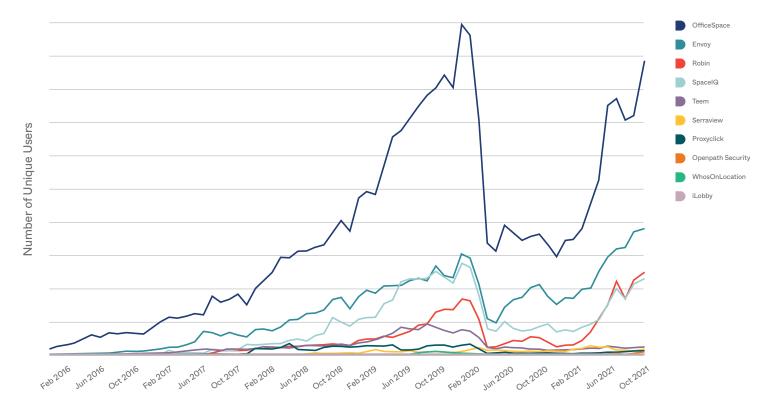Most Popular HR Tools

Supporting dynamic work

The human resources category is still growing at full throttle. Workday remains the global category leader, but second-place BambooHR is closing in fast. The self-described "HR software for SMBs" has seen 40% growth since 2020, and 189% growth since 2018. BambooHR has been the #1 HR app in the tech industry since 2017, and now claims 71% more customers than second-place Workday. Regionally, BambooHR is ranked #1 in APAC, and in EMEA where it has grown 70% year over year. In EMEA, BambooHR boasts more than twice as many customers as the second-most-popular HR tool: the casually named bob. (Bob just grabbed the second-place rank in EMEA from Workday in the fall of 2021.)

While **Ultimate Software** still holds the third spot in the global HR ranks, we see the strongest growth in tools such as **Lattice** and **Culture Amp**, which focus on employee engagement—a growing concern for today's distributed, remote teams. Lattice (up three spots to steal the #4 rank from Culture Amp this year) boasts 72% growth over the past year, and 260% since 2019. (We're not surprised, as Lattice was the sixth-fastest-growing app in last year's report.) Neck and neck is Culture Amp, close behind with 56% year-over-year growth and 173% growth since 2019. We also welcome the new entry **TriNet**, another tool targeting small businesses.

Get back to work! Top integrated workplace management tools

Most Popular Integrated Workplace Management Systems Tools by Number of Unique Users

Legend:
- OfficeSpace
- Envoy
- Robin
- SpaceIQ
- Teem
- Serraview
- Proxyclick
- Openpath Security
- WhosOnLocation
- iLobby

Note: This data includes unique users from a cohort of companies that were Okta customers between March 1, 2020, and October 31, 2021, and had an instance of an IWMS app with users assigned.

Supporting dynamic work

The pandemic brought back teenage nightmares for many organizations' HR directors: What if you threw a party and nobody came? The category of integrated workplace management tools (which help organizations optimize their use of facilities and infrastructure) provides some interesting data to precisely document the slow return of employees to office spaces after the unprecedented exodus forced by the pandemic.

Category leader OfficeSpace provides the starkest evidence of the unprecedented corporate shutdown at the outset of the pandemic: their unique users fell by a cataclysmic 69% from the end of January to the end of May 2020. Runner-up **Envoy** showed an almost identical percentage drop of 68% in the same timeframe.

But proving the adage *it's not how far you fall, it's how you bounce back*, the category's top performers are again showing strong growth in 2021, reflecting their Covid correction. Envoy already sets new high marks for unique users 25% higher than pre-pandemic, and OfficeSpace approaches their pre-pandemic level. Third- and fourth-ranked **Robin** and **SpaceIQ** have rebounded significantly, as well.
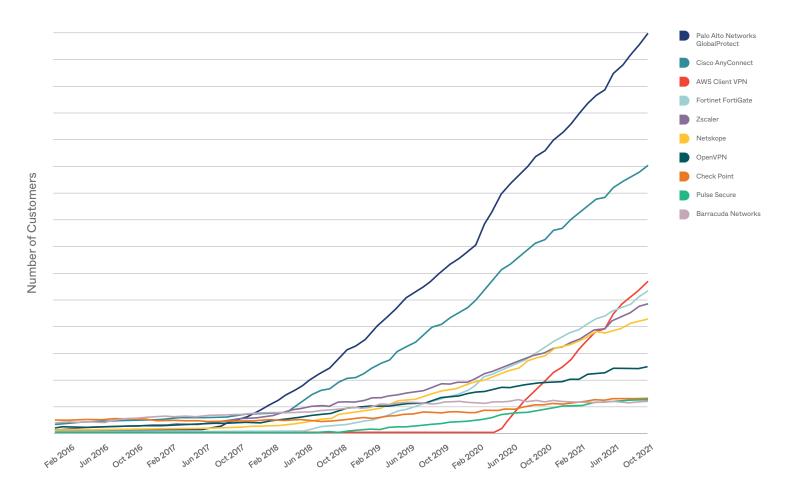
Supporting dynamic work

Pulling back to look at the entire Okta customer base, we see an overall increase in the use of IWMS tools. OfficeSpace ranks as our tenth-fastest-growing app by number of unique users with 196% year-over-year growth, and Envoy is close behind with 185%. Turning to rankings by number of customers, Envoy leads the pack with more than three times the customers of second-ranked OfficeSpace. Envoy's Okta customer base more than tripled in size since 2018, while OfficeSpace shows a very impressive 180% growth in the same timeframe. (And yeah, Lumbergh is still gonna need you to come in on Saturday.)

Encryption hits the road: remote access solutions keep dynamic work rolling

Most Popular Remote Access Solutions

Supporting dynamic work

The huge boom in usage of remote access solutions after the pandemic hit wasn't a surprise, but what's notable is the continued growth in the sector (albeit inevitably at a much slower rate) as employees return to the office. Facilitating dynamic workforces in a range of locations is proving to be an essential endeavor for many organizations, leading to an increase in the adoption of tools that make remote work safe and secure—from anywhere. With the continuing need to support a distributed workforce, Palo Alto Networks GlobalProtect, which provides enterprise security protection to mobile users, is still the clear category leader, boasting growth of 42% since 2020 and 434% since 2018. **Cisco AnyConnect**, which provides secure endpoint access, isn't far behind, showing 38% year-over-year growth (and 424% since 2018). This year has a shake-up for third place, with **AWS Client VPN**, which allows companies to easily deploy a scalable client VPN solution, jumping four spots since last year with impressive 190% year-over-year growth. This helped AWS Client VPN edge past **Fortinet FortiGate**, which still turns in a very respectable showing with 66% growth since 2020. Standalone Zero Trust network access (ZTNA) solution **Zscaler** ranks fifth, ahead of Netskope and **OpenVPN**.

While organizations are clearly intending to keep providing secure remote access for their dynamic workforces, it will be interesting to see what 2022 holds for stronger security beyond VPN.

Security at work

It's 2022. Private citizens can now go to outer space. We have self-driving cars and self-driving vacuums. Drones can deliver our dinner. We do retinal scans at the airport. It's almost like we're living in a sci-fi movie. And yet, when it comes to protecting our personal data, the **most popular password of 2021** was, *wait for it...* 123456. **sigh**

Multi-factor authentication (MFA) is estimated to **prevent 99.9%** of account takeover incidents, but use of MFA isn't universal. A small number of organizations continue to support forms of basic authentication that can't be protected by MFA, leaving them inherently more vulnerable. We dug into Okta **ThreatInsight** data to demonstrate that attackers are targeting Microsoft Legacy Authentication methods of access at much higher rates than modern authentication.

Looking deeper into MFA, there is huge variation in the strength of factors deployed by customers. We look at both our **workforce identity** customers as well as our customers that deploy **customer identity access management (CIAM)** for their own end users to uncover factor trends.

Our data shows that both workforce and CIAM customers are generally trending away from weaker knowledge-based factors toward stronger possession-based factors such as Okta Verify and biometric factors that support WebAuthn.

Beyond MFA, Okta customers have demonstrated that they are sold on the vision of Zero Trust, and are rapidly progressing their journey from unified access management to contextual-based access. Customers are increasingly assessing the security behaviors of users and factoring in other risk signals at authentication.

Security at work

Modern authentication is critical: hackers go for easy targets

Two things can be true at the same time: attackers are smart, and attackers are lazy. And guess what makes for an easy target? Legacy Authentication.

This year we wanted to test the hypothesis that attackers are deliberately targeting Microsoft 365 accounts in organizations that allow Legacy Authentication. Microsoft calls "Legacy Authentication" any method to authenticate to Microsoft 365 that doesn't support MFA. Accounts with Legacy Authentication enabled are far more vulnerable to credential stuffing because the security of the account relies on the strength of user-defined passwords. Microsoft has given Microsoft 365 customers until October 2022 to retire this method of authentication.

So, we compared Okta customers that allow Legacy Authentication with those that don't. Our measure of comparison was the ratio of requests detected as malicious by Okta ThreatInsight over successful authentication events.

The data suggests that attackers are targeting accounts using Microsoft Legacy Authentication to access Microsoft 365 at rates 10 or more times higher than those using only modern authentication protocols.

53x

Organizations using Microsoft Legacy Authentication on average face a 53 times higher ratio of threats to authentications

On average across all industries, organizations using Microsoft Legacy Authentication face a **53 times higher ratio** of threats to authentications compared to organizations that do not allow Legacy Authentication. When we look at specific industries, we see:

- Government organizations using Microsoft Legacy Authentication face a **104 times higher** ratio of threats to authentications.
- Education organizations using Microsoft Legacy Authentication face a **65 times higher** ratio of threats to authentications.

Security at work

- Wholesale trade businesses using Microsoft Legacy Authentication face a **58 times higher** ratio of threats to authentications.
- Healthcare organizations using Microsoft Legacy Authentication face a **36 times higher** ratio of threats to authentications.

We found that there is at least a 90% reduction in the ratio of threats to authentications when an organization denies access using Microsoft Legacy Authentication in access policies. Depending on the industry, this can be as high as 99%. So it appears our hypothesis was correct: the attackers behind large-scale credential-based attacks are far more likely to target orgs that support Legacy Authentication.

Leveraging Modern Authentication Reduces the Ratio of Threats to Authentications

Reduction in ratio of threats detected to authentications when Microsoft Legacy Authentication is not enabled

Technology	99.6%
Government	99.0%
Education	98.5%
Wholesale Trade	98.3%
Real Estate, Rental, and Leasing	98.2%
Energy, Mining, Oil, and Gas	97.9%
Professional Services	97.9%
Retail	97.9%
Healthcare and Pharmaceuticals	97.2%
Transportation and Warehousing	96.7%
Nonprofit	96.6%
Manufacturing	96.5%
Construction, Engineering, and Architecture	96.5%
Media and Communications	96.4%
Arts, Entertainment, and Recreation	96.2%
Finance and Banking	96.1%
Insurance	89.6%

80%   100%

Percent Reduction in Ratio of Threats to Authentications

The sky isn't necessarily falling, but we want to help provide solutions. Check out this guide to **identifying and deprecating** Legacy Authentication.

Security at work

> " This exercise demonstrates what security professionals already intuitively know: attackers direct their attention toward the path of least resistance, and accounts **without** MFA protection make for a much easier path. Not only are accounts without MFA more **vulnerable** to auth-based attacks like credential stuffing, but they are **actively targeted** more aggressively by attackers.
>
> Marc Rogers
> Senior Director of Cybersecurity, Okta

The rise of multi-factor: stronger security vs factor friction

Let's first look at trends broken out by specific factors.

Among all customers authenticating with a factor, WebAuthn has risen from 2% in 2019, to 12% in 2020, to 16% in 2021. WebAuthn replaces passwords with a strong, convenient, and unphishable factor that authenticates users to web services via their device (e.g., Apple TouchID, Windows Hello) or physical keys. Workforce identity customers in the tech sector, those traditional trendsetters, show the highest adoption of WebAuthn at 27%, up from just 4% in 2019. Close behind the tech sector, WebAuthn is used most by media and communications (26%) and retail (21%). We can likely expect even more traction from WebAuthn now that **FastPass**, Okta's passwordless technology, is generally available. (Going forward in our data, WebAuthn is rolled up with U2F and YubiKey in the grouping of "security key or biometric factors.")

Security at work

Use of Okta Verify (including Okta Verify with push notifications) continues to rise steadily. Overall, 85% of customers use Okta Verify, up from 82% in 2020 and 74% in 2018. Okta Verify is much more popular among workforce customers (86%) than CIAM customers (39%).

Five other one-time push (OTP) authenticators have remained mostly flat since 2018: Google Authenticator at 42%, Duo Security at 8%, RSA SecurID at 1%, HMAC-based one-time passwords (HOTP) at .5%, and Symantec VIP at .4%. (Going forward in our data, these factors are rolled up as "other OTP authenticators" in our charts.)

Use of email as a factor has grown among both CIAM and workforce customers throughout the pandemic. During the pandemic, organizations were often unable to provide all their employees with company-issued devices for other factors, driving some increase in the use of email as a factor. Now 12% of customers use email as a factor, up from only 7% in 2020.

SMS factors, which provide a weaker level of protection, are showing a small decline in usage, dropping from 49% last year to 47% this year. SMS remains the most-used factor among CIAM customers, but is dropping steadily among workforce customers. (Going forward in our data, we group SMS with voice call authentication for a factor grouping of "SMS/call.")

Security questions, notoriously one of the weakest factor options, are similarly on the decline, dropping from 18% in 2018 to 13% today for both workforce and CIAM customers.
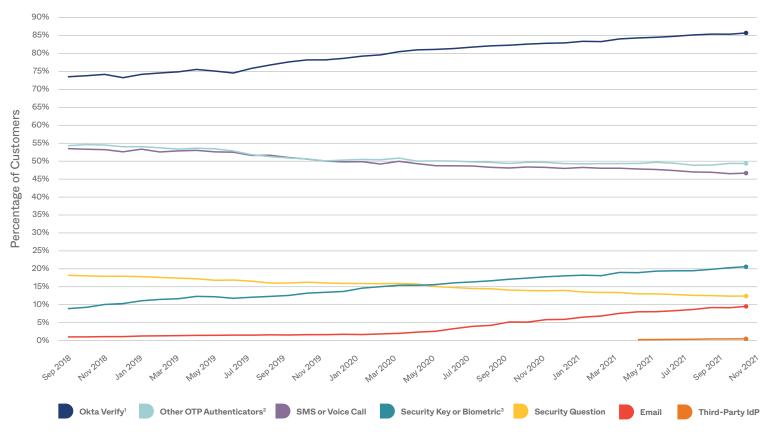
Overall, a key difference we see between workforce identity and CIAM factor trends is that any factor offered to customers tends to stick for a longer period of time. While an employer can easily replace or complement existing authentication methods with new, stronger factors as they become available, it can be difficult to motivate customers to opt in to those changes unless they are clearly presented with an option that is both more secure *and* more convenient. In other words: bring on that passwordless future!

Security at work

Factor grouping	Factor included
Email	Email
Okta Verify	Okta Verify (including Okta Verify with Push Notifications)
Other OTP Authenticators	Duo Security, Google Authenticator, HOTP, RSA SecurID, Symantec VIP
Security Key or Biometric	WebAuthn (FIDO 2.0), U2F (FIDO 1.0), YubiKey
Security Question	Security Question
SMS/Call	SMS, Voice Call
Third-Party IdP	Third-Party IdP

In the workplace: factoring in the threat environment

Okta's Workforce Identity Customers Deploying Each Factor Grouping

¹ Okta Verify, Okta Verify with Push Notifications   ² Duo Security, Google Authenticator, HOTP, RSA SecurID, Symantec VIP   ³ WebAuthn (FIDO 2.0), U2F (FIDO 1.0), YubiKey

Security at work

While any second factor is better than relying on a username and password, Okta has **long preached** the importance of choosing stronger, higher assurance factors to provide superior protection to online accounts.
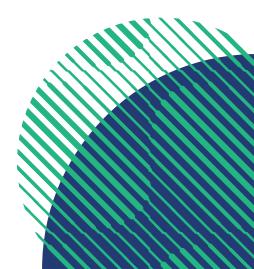
Our workforce identity customers agree. We continue to observe a welcome decline in the use of weaker SMS/call and security questions as authentication factors by our workforce customers, and corresponding growth in the use of stronger security alternatives.

Use of SMS/call authentication has declined from 53% in 2018 to 47% of customers today. Among tech workforce customers, only 34% are using SMS/call authentication, down from 47% in 2018.

The use of security questions as a factor has dropped from 18% in 2018 to 12% today for workforce customers. Meanwhile, the use of email has grown to 10% today, up from 2% in February 2020. Its popularity rose with the pandemic and has not subsided.

Use of other OTP authenticators is on a slight decline, used by 49% of customers today compared to 55% in 2018. Among tech customers, 67% use other OTP authenticators, compared to 74% in 2018.
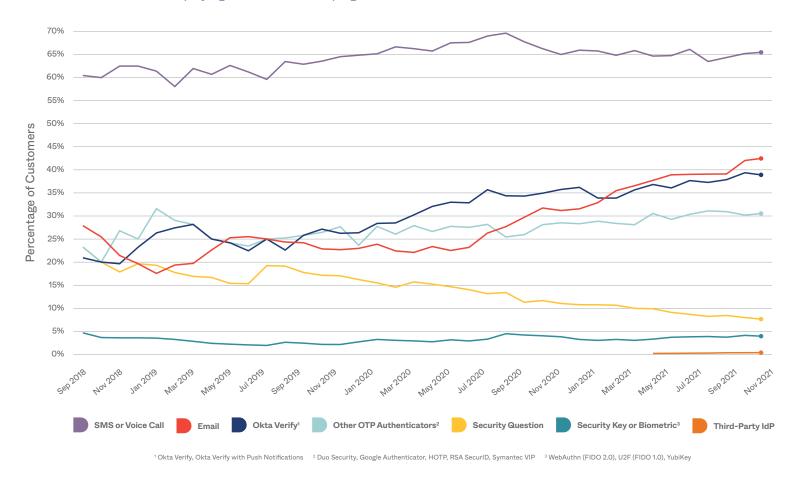
All signs are pointing to a passwordless future: Okta Verify (including Okta Verify with push notifications) is now used by 86% of workforce customers (versus 74% in 2018), but rarely is it relied upon exclusively. Security key and biometric factors have grown in popularity, from 9% in 2018 to 21% today. Among the tech sector, use of security key/biometric factors reaches 30%.

Customer-facing apps: it's always been about choice

Okta's CIAM Customers Deploying Each Factor Grouping

SMS or Voice Call   **Email**   **Okta Verify[1]**   **Other OTP Authenticators[2]**   **Security Question**   **Security Key or Biometric[3]**   **Third-Party IdP**

[1] Okta Verify, Okta Verify with Push Notifications   [2] Duo Security, Google Authenticator, HOTP, RSA SecurID, Symantec VIP   [3] WebAuthn (FIDO 2.0), U2F (FIDO 1.0), YubiKey

Security at work

Looking specifically at customer-facing apps, the shift from SMS/call authentication is less pronounced. In many scenarios, organizations must balance customer experience and ease of use with security.

It's true that any second factor is better than only offering one. In fact, we have seen a sharp decline in the number of organizations deploying only one factor, from 58% in 2018 to 39% today. Organizations deploying customer-facing apps historically offer their end users the broadest mix of readily available factors possible, with SMS/call (the most common), email, and Okta Verify (including Okta Verify with push notifications) as the leading options.

Interestingly, while the use of email is leveling off for workforce access, it's growing as a factor for CIAM: 43% now, versus 32% in 2020 and 26% way back in 2018. Use of security questions is down from 17% in 2019 to just 8% today, and while the security key and biometrics category appears flat, 3% of CIAM customers now deploy WebAuthn (FIDO 2.0)—a 50% increase from 2020.

Security at work

Marching toward Zero Trust: preparing for a secure future

A Zero Trust approach takes the position that the only way to truly protect data is to treat all user traffic as untrusted. Spurred on by Covid-19, remote work has driven the adoption and implementation of Zero Trust. An **Okta survey** of over 600 global business and security leaders reveals that in 2020, 41% of organizations said they were working on a Zero Trust initiative or intended to start one in the near future. In 2021, that number spiked to 90%.

Looking at **Okta's Zero Trust Maturity Curve**, the survey revealed that the APAC region has progressed by leaps and bounds, with all projects in Stage 1 of the Zero Trust Maturity Curve expected to be adopted by more than half of all companies by 2023. (At least half will adopt four out of the five main initiatives in Stage 2 as well.) North American companies are a bit further behind, but building momentum. Connecting employee directories to cloud apps is an essential step along the Zero Trust Maturity journey, and 74% of organizations have already done this, or will do so in the next 12 to 18 months.

Which industries lead the way? Not surprisingly, sectors with the most sensitive information are moving the fastest. Financial services, healthcare (with their strict compliance requirements and accelerated digitization due to the pandemic), and software companies are making Zero Trust a priority.

Progress in Adopting Zero Trust

+91%

Network Context

Percentage of customers leveraging **risk-based policies** increased from 2.2% in October 2020 to 4.2% in October 2021.

+31%

User Context

Percentage of customers leveraging **WebAuthn** increased from 11.8% in October 2020 to 15.5% in October 2021.

+9%

Device Context

Percentage of customers leveraging **device trust** increased from 7.7% in October 2020 to 8.4% in October 2021.

Security at work

The Zero Trust security model requires that requests to access applications and data are resolved by a dynamic, real-time assessment of **user, device, and network context**.

There are several policy levers to make this a reality for customers. With Okta, identity can be verified based on the authenticators (factors), devices, and network attributes historically associated with any given user. Several third-party integrations now provide opportunities to also verify device posture (Is the device patched? Is it free of malware?) and an array of other attributes relating to user, device, or network behavior.

Okta's customers have demonstrated that they are eager to begin this journey. We've observed an increase in new customers enrolling users in higher assurance factors (such as WebAuthn), as well as growth in the number of customers restricting access to known (registered) devices or requiring step-up authentication when a user requests access from an unfamiliar device.

The most telling statistic is the 91% rise in customers using risk-based authentication. Customers are increasingly configuring sign-on policies in which the risk of a request is evaluated based on network reputation and whether there is any measured deviation from previous user behavior (such as their device or location). This evaluation promises to deliver stronger security outcomes without any additional friction or constraints to legitimate users.

The Zero Trust model demands that user identity be reassessed on a continual basis post-authentication, either after specified time intervals or based on the risk associated with every subsequent user activity. Okta's risk-based authentication policies can be tailored such that users exhibiting new or riskier behaviors are subject to step-up authentication, while those that continue to exhibit the same known attributes can press on with their work uninterrupted.

For customers using risk-based authentication policies, the most critical building blocks of a Zero Trust strategy are already in place.

Security at work

> "
>
> Enabling customers with the tools they need to implement a Zero Trust strategy is a top priority for us. Seeing such a significant increase in WebAuthn as a factor and the growing adoption of risk-based network policies indicates that it is a priority for our customers as well, and I'm hopeful that this trend will continue.
>
> David Bradbury
> Chief Security Officer, Okta

App development matures

A developing story: building awesome apps for customers

We've adapted to the pandemic by adopting apps for nearly everything we do. Now almost every interaction between consumers and brands is happening online, and companies are investing heavily to build frictionless, personalized, and seamless digital experiences for their customers. This trend is only expected to increase, as IDC predicts, "Recognizing that software is likely to be the engine that drives revenue and business value in the coming years, many companies want to develop more software." *
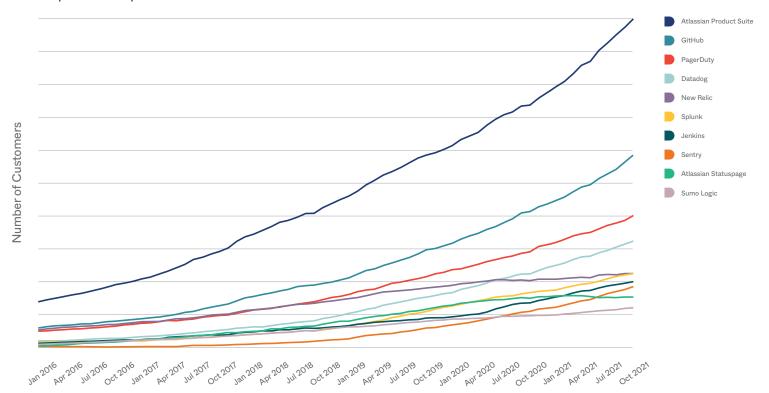
Looking at our most popular developer tools, Atlassian Product Suite and GitHub continue to be crowd favorites, but the story goes much deeper. This year, we see substantial growth in apps that help organizations monitor their systems and respond quickly, which tells us that developers are focused on the long tail of the development process.

*IDC, IDC Software Development Insourcing Is on the Rise, Doc #US48106221, August 2021.

When it comes to SDKs, JavaScript is by far the most popular tool, primarily driven by the use of React and its open source support.

In our crazy world, developers and operators are looking for reliability

Most Popular Developer Tools

Legend:
- Atlassian Product Suite
- GitHub
- PagerDuty
- Datadog
- New Relic
- Splunk
- Jenkins
- Sentry
- Atlassian Statuspage
- Sumo Logic

Y-axis: Number of Customers

X-axis: Jan 2016, Apr 2016, Jul 2016, Oct 2016, Jan 2017, Apr 2017, Jul 2017, Oct 2017, Jan 2018, Apr 2018, Jul 2018, Oct 2018, Jan 2019, Apr 2019, Jul 2019, Oct 2019, Jan 2020, Apr 2020, Jul 2020, Oct 2020, Jan 2021, Apr 2021, Jul 2021, Oct 2021

Note: The Atlassian Product Suite includes Confluence, Jira, Trello, and Bitbucket, which are frequently accessed together via a subscription to Atlassian Access.

App development matures

This year's data suggests that developers are expanding their scope: monitoring and visibility are becoming just as critical as development itself. Developers are increasingly looking to facilitate long-term app stability, including creating processes around outages and monitoring applications to find trouble before it becomes a major problem.

In the quest for "five nines" of reliability, customers are driven to find greater visibility into their environments, whether they are on-premises, in the cloud, or a hybrid, as they transform to embrace the cloud. As developers and DevOps engineers lean into tools that ensure better site reliability, the process and efficiency affects the entire organization. This list features industry leaders that span the app development lifecycle.

Out of the top 10 most popular developer tools, a full seven deal with app monitoring and incident response. Four of the top 10 are log aggregators: **Splunk**, **Datadog**, **New Relic**, and **Sumo Logic**. Two are monitoring systems: **Sentry** and **Atlassian Statuspage**. One, **PagerDuty**, is an incident management system. As would be expected in an era of rapidly expanding cloud-based systems and work-from-anywhere proliferation, the tools needed most are those that help organizations monitor their systems and respond quickly when things go wrong. Monitoring and error tracking app Sentry—a fastest-growing app in last year's report, also up one spot in the developer tools chart this year—shows the most year-over-year growth with an impressive 68%. Datadog grew 44% year over year, and PagerDuty grew 38% in that time.

Only three of the most popular developer tools are focused on productivity, but these are clear market leaders: Atlassian for ticket management and GitHub for source control (the #1 and #2 here), and Jenkins for app deployment. This suggests that productivity is largely a solved problem amongst key market players in their respective areas. Yet, as the go-to tools for the functionality they provide, these popular solutions are still showing strong growth year over year: Atlassian grew 36% since our 2020 report (and 134% since 2018); GitHub clocks in at 41%, having doubled since 2018; **Jenkins** reports 47% year-over-year growth; and Sumo Logic sees a respectable 25%.
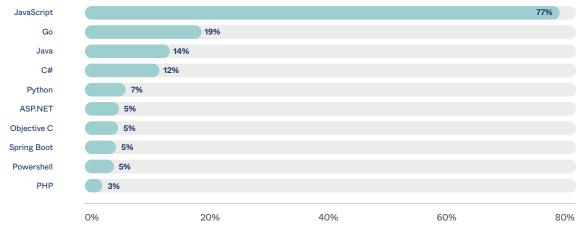
We would also like to give a shout-out to two developer tools that appear in our fastest-growing apps. First, Postman is this year's third fastest-growing app by number of customers. Since 2016, only one other developer tool has reached the top three fastest-growing apps by number of customers: Atlassian Opsgenie, in 2019. Postman is an API management tool used to develop, test, and monitor APIs, and it's often added to API gateway solutions. Companies seem to be modernizing around an API-first mindset.

Customer data platform (CDP) provider **Twilio Segment** ranks as our seventh fastest-growing app by number of unique users, with 325% year-over-year growth. CDPs can provide insights into behavior patterns, allowing companies to learn more about their customers and apps through data. These tools are often used by customers such as retailers looking to drive strong promotions that will lead to user conversions.

SDK tools: developers build with JavaScript and React

Customers Using SDK Tools

JavaScript	77%
Go	19%
Java	14%
C#	12%
Python	7%
ASP.NET	5%
Objective C	5%
Spring Boot	5%
Powershell	5%
PHP	3%

0%   20%   40%   60%   80%

Percentage of Customers

Note: Data limited to customers with at least one SDK event between November 1, 2020, and October 31, 2021.

App development matures

It's no secret that app use and proliferation continues to increase in the era of exponentially increased deliveries and subscriptions—Apple **reported** last June that their App Store ecosystem alone was responsible for $643 billion in billings and sales in 2020, a 34% increase from the previous year. This meteoric rise in apps shows no sign of slowing down, a trend we're also seeing play out in developers' use of software development kits (SDKs). If you build it, customers will come… and to build it, you need an SDK.

Looking at the breakdown of the most popular tools, we see one name sprinting away from the rest of the pack: **JavaScript**, which boasts usage by a stunning 77% of customers—a huge jump from already impressive totals of 63% last year and 23% in 2019. Why the huge increase in adoption? We see that a) Javascript is effectively becoming the dominant language of the modern internet, and b) customers are adopting the JavaScript-based library **React**, a core tool for website creation. More people are using React than any of the other frameworks like **Angular JS** and **Vue JS**. React now has five times more customers using it than frameworks Angular, Vue, and React-Native combined. (Broken out by itself, React has 53% adoption.)

Go is used by 19% of customers using SDK tools, enough to hold its second-place spot ahead of **Java** and **C#**. The popularity of Go points to the use of identity to secure servers. Go is leveraged by Terraform by HashiCorp, which is very hot right now with the DevOps push to Infrastructure as Code (IaC). Note that Terraform by HashiCorp is called out in our cloud platforms section for its growth of 70% within just the past six months.

App's all, folks!

The world's post-pandemic future is taking shape. Many workforces will be partly or wholly remote on an ongoing basis now, driving increased adoption of tools that promote and secure remote collaboration and keep employees connected and engaged. For many companies, digital transformation will shift from a project-based initiative to an ongoing review-and-refine process. Developers will continue to build apps that support our new remote habits, at work and at home. Innovative, interoperable solutions will continue driving tech stack diversity, including increased use of multiple cloud platforms, and the addition of best-of-breed apps that offer the best functionality. No matter the obstacles in our paths, we will find ways to work efficiently and stay connected.

Okta is the leading independent identity provider. The Okta Identity Cloud enables organizations to securely connect the right people to the right technologies at the right time. With more than 7,000 pre-built integrations to applications and infrastructure providers, Okta provides simple and secure access to people and organizations everywhere, giving them the confidence to reach their full potential. More than 14,000 organizations, including JetBlue, Nordstrom, Siemens, Slack, Takeda, Teach for America, and Twilio, trust Okta to help protect the identities of their workforces and customers.