IBM Cloud

The enterprise outlook on cloud-native development

Key findings according to development executives, application developers and IT executives

IBM

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Overview

In 2018, IBM commissioned research focused on the adoption of the cloud-native development model in enterprise technology organizations. This report highlights the main benefits, drivers and challenges related to adopting the model.

Two-thirds of the 152 respondents are from companies with 1,000 or more employees. They divide evenly across the roles of IT executive, development executive, and lead developer. All are involved in decisions on how their teams use a cloud platform.

Topline results indicate that businesses plan to move 75 percent of their existing non-cloud applications to cloud within three years. The majority of those applications will be lifted and shifted or modernized.

Key terms

Cloud-native development

An app built either net new with microservices or modernized in the cloud with the addition of new microservices, or refactored into microservices from an existing monolith.

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Fact findings on cloud-native development

Companies that emphasize the importance of innovating their customer experience are quick to see the value of adopting the cloud-native development model.

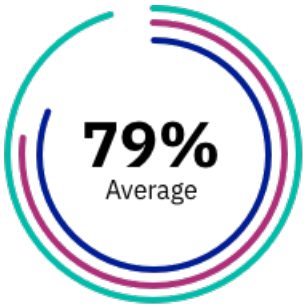
Application performance

Application performance stands out as the priority for all roles within the enterprise. Improved app performance not only correlates with ease of development but also with improved app quality, polyglot coding support, application development automation and reduced dependencies.

Improved application performance

Dev execs 84% | Devs 86% | IT execs 79%

Reduced application downtime and associated costs



Dev execs 94% | Devs 72% | IT execs 74%

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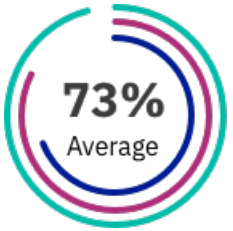
Flexibility and speed

Overall efficiency in using the cloud platform, including the flexibility to add features and to scale resources up or down to meet user demand, is particularly important to application development executives. This results in employee productivity, speeding up app updates and enabling faster business growth.

Quicker development and roll-out of application enhancements/new features

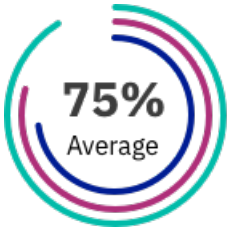


Dev execs 97%

Devs 77%

IT execs 64%

Easier application management



Dev execs 83%

Devs 73%

IT execs 68%

Greater flexibility to scale app resources up or down automatically to meet real-time changes in demand

Dev execs 78%

Devs 78%

IT execs 67%

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Adoption is widespread

Over half of new applications to be developed in the next year will be cloud-native. Among current adopters of the model, 53 percent of applications are cloud-native.

78%

78 percent of companies planning to develop apps in the next year are designing at least one of those apps to be cloud native.

Enterprise apps

Among enterprise applications, data analytics, business intelligence, and any application that uses a database are the most commonly designed and built with the cloud-native model.

In terms of app-building technologies

67%

Expect to use APIs in composing their apps

43%

Express interest in or use containers

47%

Express interest in or use microservices

↑**50%**

Over 50 percent see these aspects of cultural transformation as key to their success with cloud-native app development:

- Small teams own specific components of the overall application
- Continuous development, delivery and performance monitoring
- Collaboration between application developers and IT operations experts
- Active participation of key stakeholders
- Greater analysis of data related to end user behavior
- Continuously and centrally integrating source code updates across the team
- A pipeline that deploys apps in development, test, staging and production environments

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Working in the cloud

Approximately three out of four non-cloud applications will move to cloud in the next three years — most commonly by being lifted and shifted or modernized. Most intend to extend a modernized or existing cloud app with advanced services.

Key terms

Lift and shift

Move workloads or applications into cloud VMs.

Modernize

Move applications into a cloud container environment.

Extend

Add new features and functions to an app after modernization.

75%

43% Lifting and shifting
42% Modernizing
42% Extending

75 percent of non-cloud applications will move to cloud environments over the next three years. Beyond lifting and shifting, most cloud-based apps will be modernized and extended.

42%

42 percent of existing cloud apps will be extended with new features and functions.

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Advanced services

Among the advanced cloud services associated with cloud-native development, IoT and AI technologies are predominately used, with over half of the current applications using one or more advanced service. Across most companies, multi-device support is a nearly ubiquitous requirement for cloud-native applications.

IBM Cloud flies with American Airlines

To deliver a mobile app that empowers customers to manage their own travel, American Airlines used the IBM Cloud platform and the IBM Cloud Garage method.

→ **Watch the video**

55%

55 percent of companies have used IoT technologies

53%

53 percent have used AI/ML capabilities for business intelligence

25%

25 percent so far have used blockchain or Augmented Reality capabilities in at least one app

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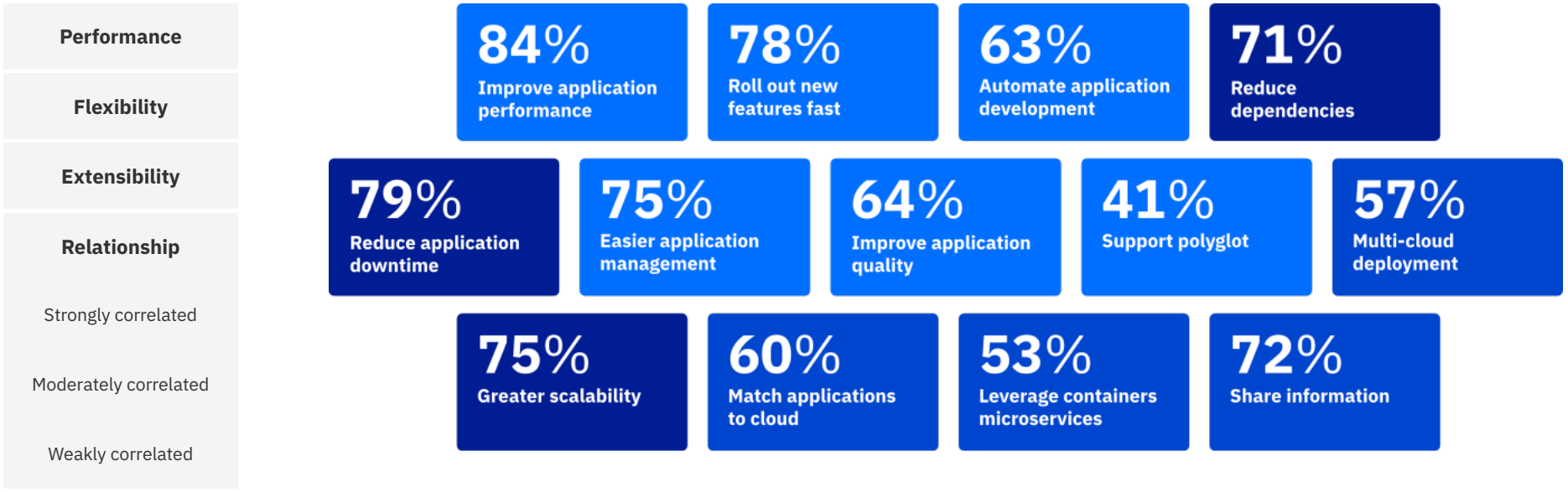
Motivators and barriers

There are both app-specific and deployment-related motivations for adopting cloud-native development.

Explore the motivators relationships:



Key insights

- Improving app performance is a top driver for all roles
- Heightening application security is the most influential factor for interest in development automation
- Specific compute technologies like containers, platform extensibility to private or public cloud environments, and supported programming languages are less influential than larger business benefits

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Motivators and barriers

There are both app-specific and deployment-related motivations for adopting cloud-native development.

Explore the motivators relationships:

Performance

Flexibility

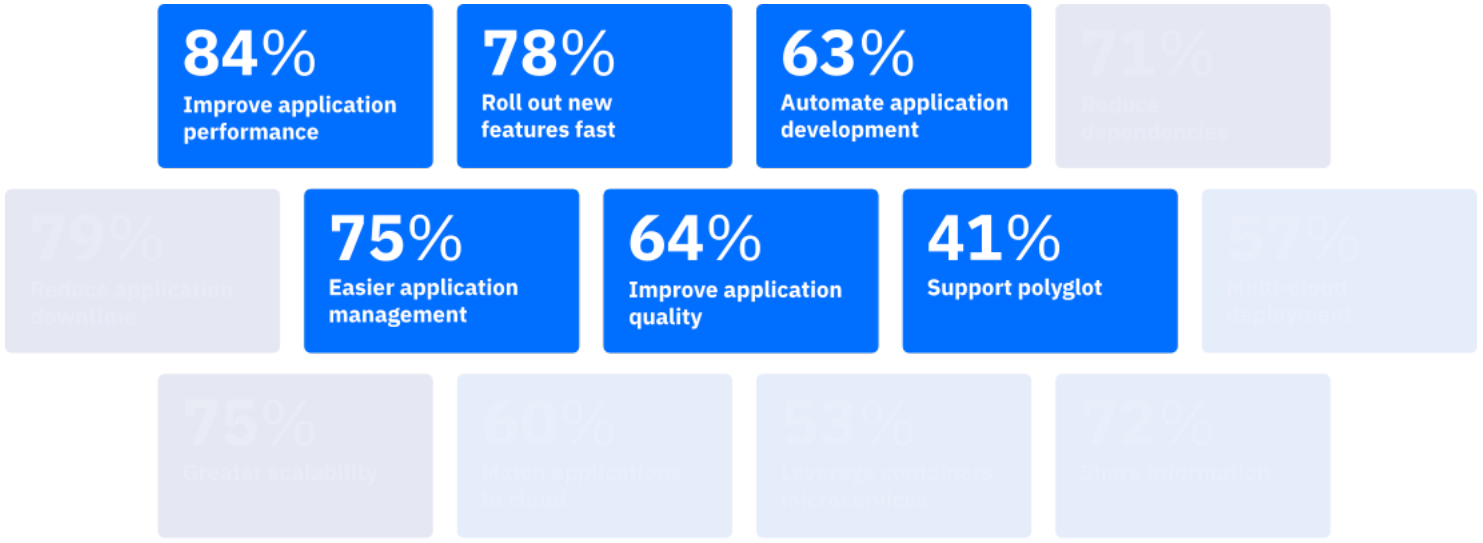
Extensibility

Relationship

Strongly correlated

Moderately correlated

Weakly correlated



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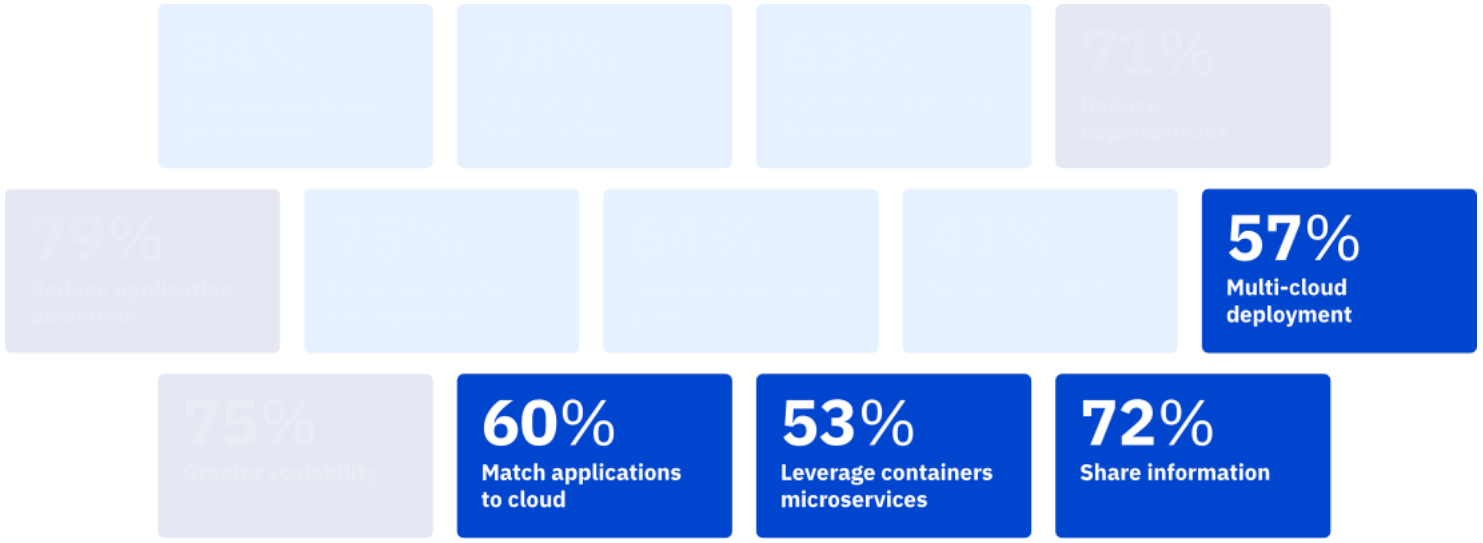

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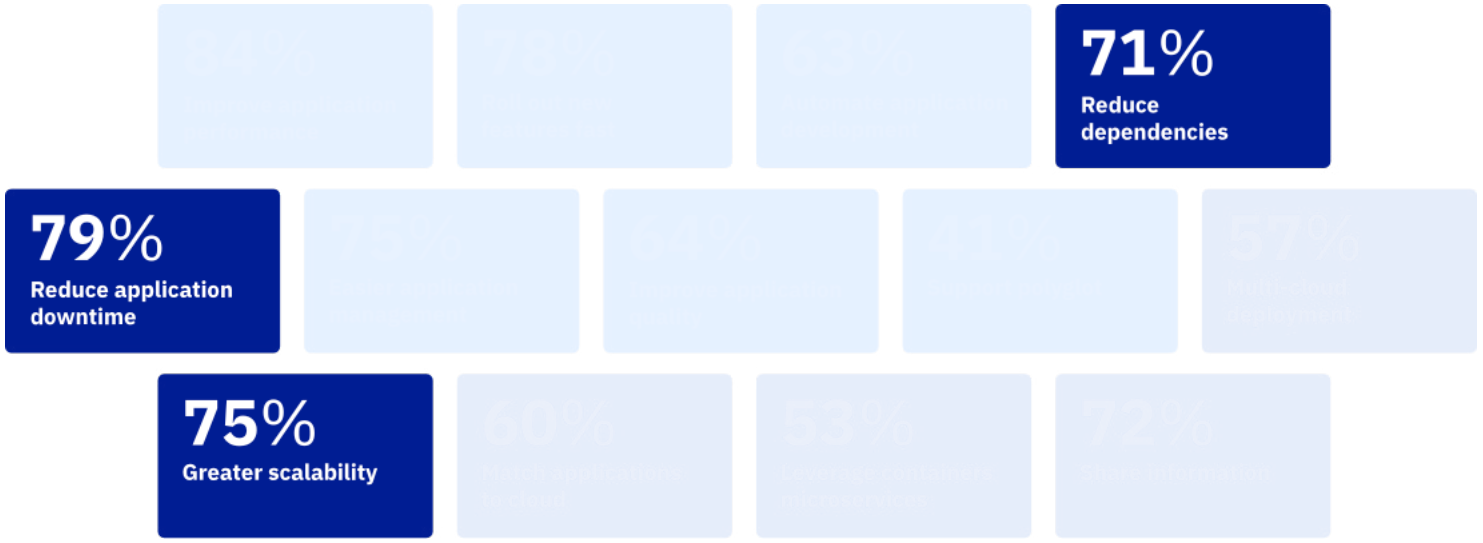

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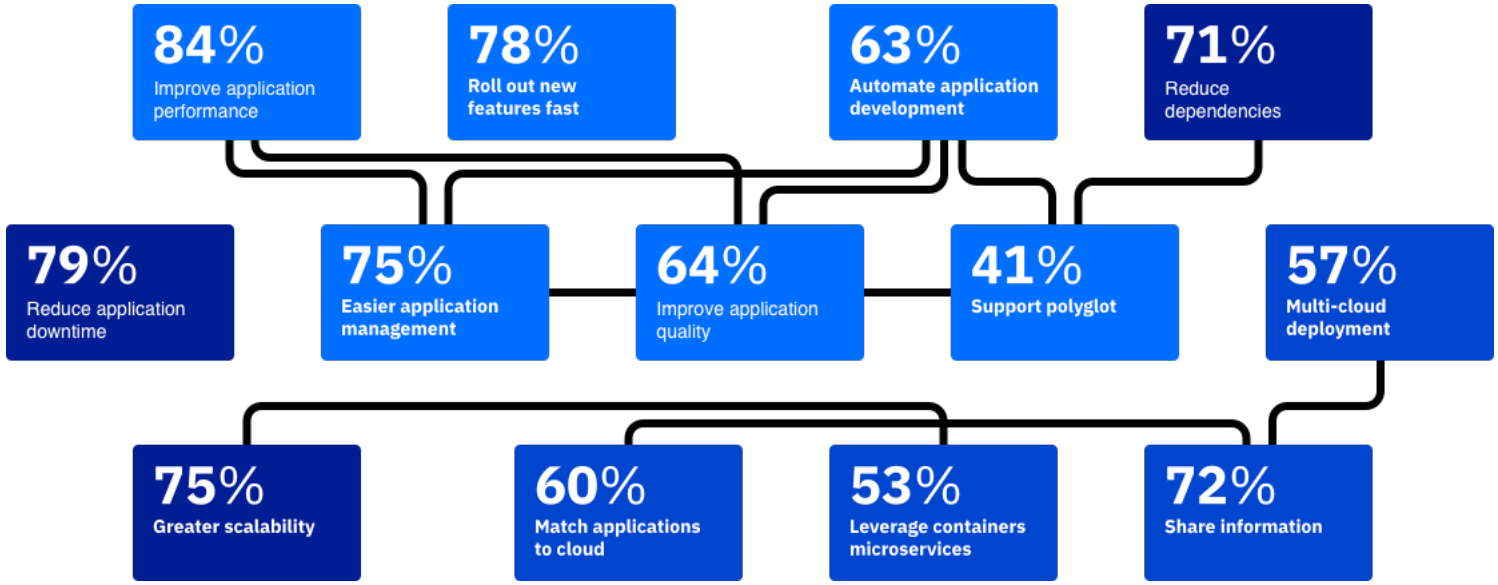

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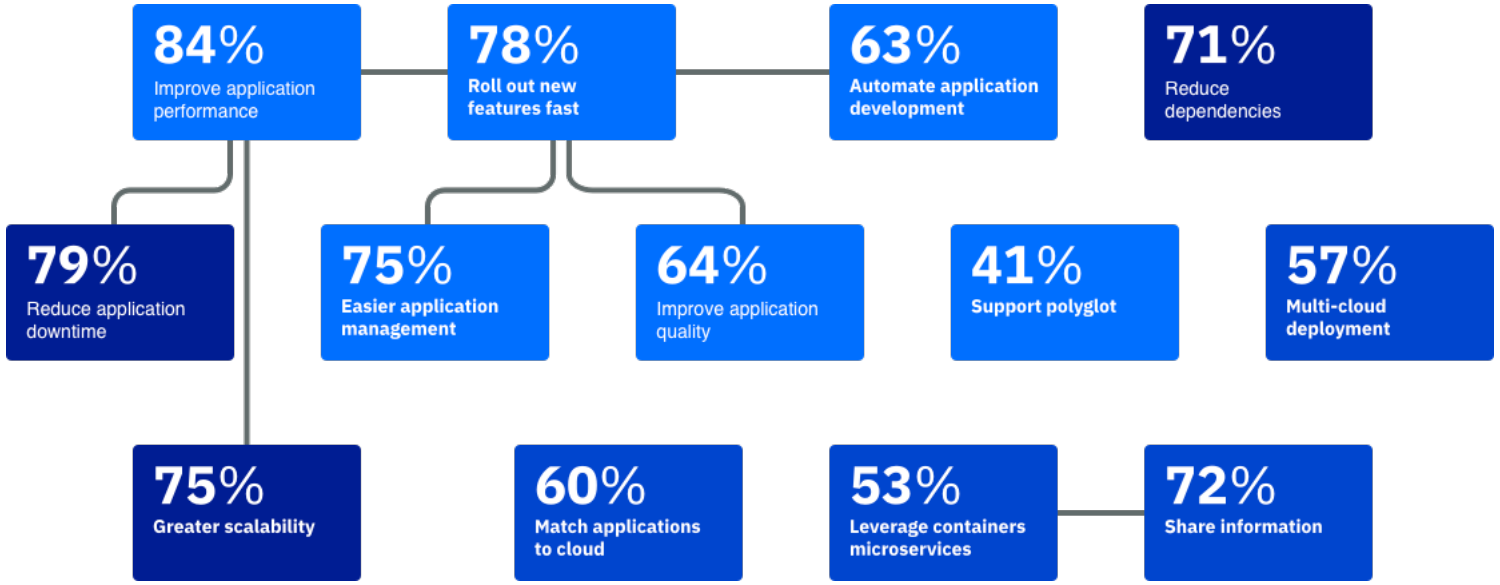

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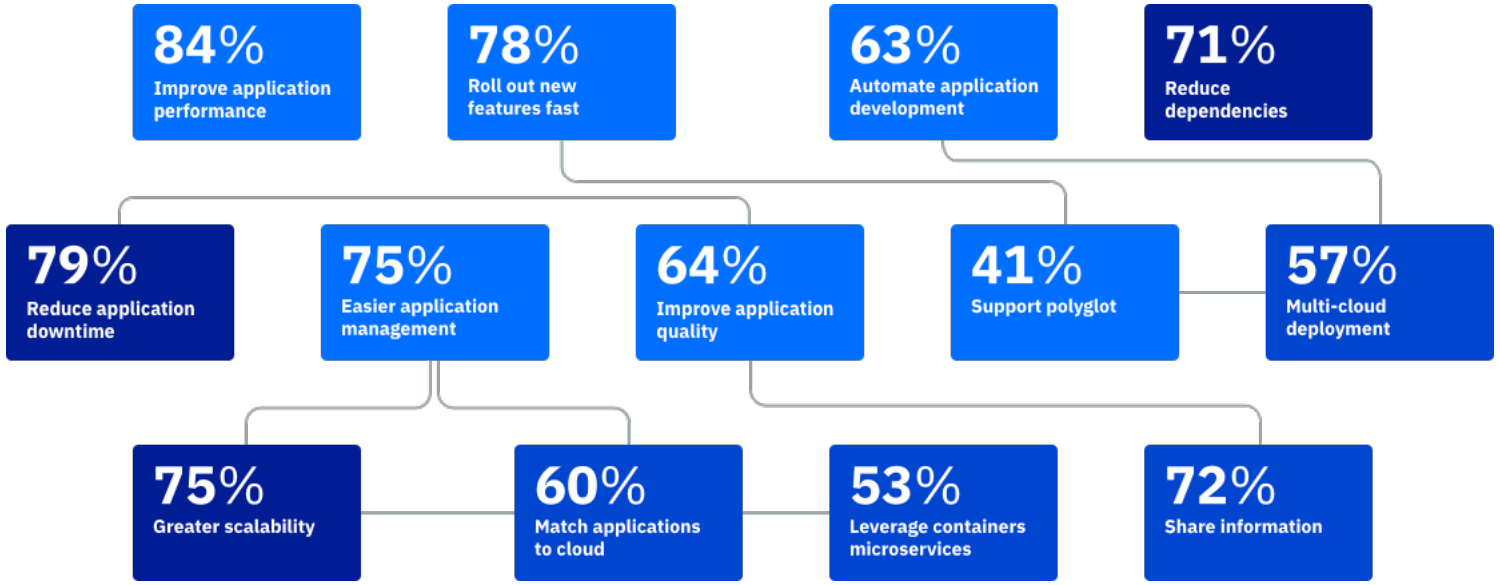

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Key benefits by role

Application developers

- Application developers greatly value how cloud-native development and cloud platforms improve application performance **(86%)** by flexibly scaling resources up or down to meet real-time demand changes **(78%)**.
- Application developers say they can develop and roll out application enhancements more quickly **(77%)**, which has led to rapid digital business growth **(68%)** and faster responses to market changes **(67%)**.
- Though application developers have initial concerns about the enterprise readiness of cloud platform security **(60%)**, they end up citing better security across their company and its customer data as a benefit of adoption **(64%)**.

Application development executives

- In terms of business value, application development executives focus on the internal efficiencies **(94%)**, valuing reduced application downtime and associated costs.
- They tie adoption to faster development and roll-out of new features **(92%)** and improved application performance **(84%)**.
- Though senior executives were skeptical about cloud-native development **(49%)**, their teams report lower operations costs **(78%)**, experience better security **(76%)** and drive more rapid digital business growth **(77%)**.

IT executives

- IT executives also value application performance improvements **(79%)** and reduced downtime and related costs **(74%)**.
- Unique to their perspective is the importance of reduced dependence on particular infrastructure or operating systems **(71%)**.
- Though IT executives are skeptical of application development teams being able to use cloud platform technologies effectively **(64%)**, they note improved employee productivity **(62%)** and better application security overall **(70%)**.

Key challenges by role

Skepticism about security, internal inexperience and lack of expertise with cloud platforms are the main hurdles for organizations to overcome in adopting cloud-native development. Perception of these barriers differs by role.

Application developers

- Concern that security of the platform may keep cloud-native applications from being enterprise-grade **(60%)**
- Uncertainty regarding the time and costs involved in building cloud-native applications **(52%)**
- Insufficient internal expertise in platform technologies for developing cloud-native applications **(50%)**

Application development executives

- Skepticism among senior/influential IT executives (49%)
- Skepticism among senior/influential business executives (48%)
- Concern that security of cloud-native applications may not be enterprise-grade (47%)

IT executives

- Insufficient internal expertise with cloud platform technologies impedes ability to develop cloud-native applications **(64%)**
- Difficulty in assessing which existing applications would benefit from rebuilding as cloud-native applications **(51%)**
- Uncertainty regarding the time and costs involved in building cloud-native applications **(48%)**

We recommend

As a way to get IT executives on board with the importance of change, involve them in using design thinking techniques to clarify user expectations and experience. Include them as partners in defining a new app development process that has agreed upon business goals. Choose a cloud platform provider with a cloud-native development acceleration program, and consider a managed Kubernetes environment for developing, deploying and iterating the business critical applications your team is moving to or creating in the cloud. For applications that run only to complete periodic parts of an application workflow, use serverless technology (event-triggered functions, for example).

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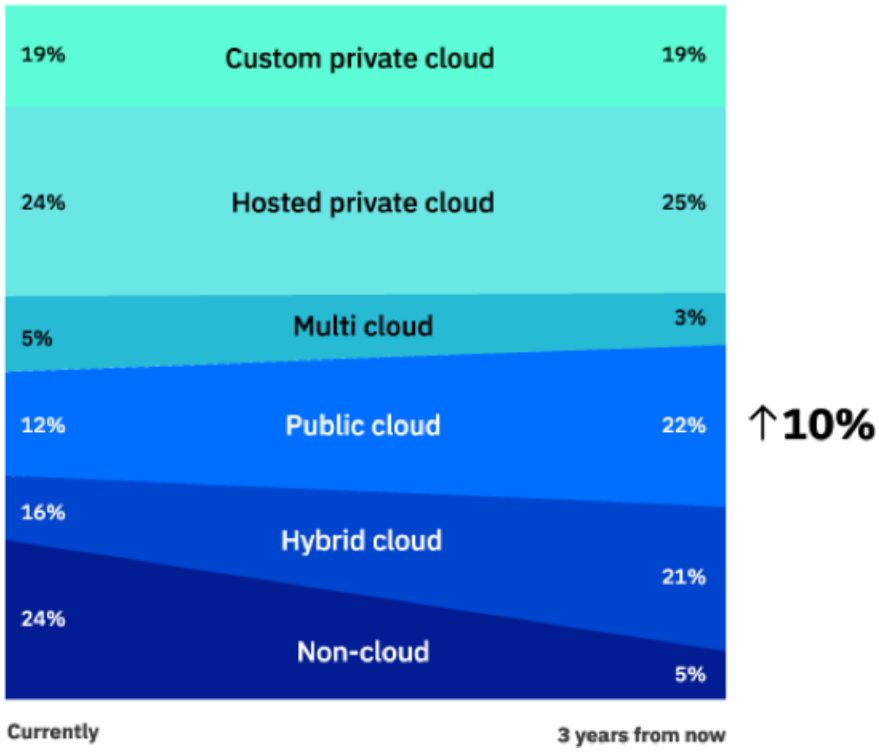
Evolving environmental preferences

Work on existing applications and new application development will continue to shift onto cloud platforms in the next three years, with most happening in public cloud environments. **Public cloud deployments will almost double due to migrations from other environments and few migrations away from it.**

Hybrid cloud will also show significant growth, while deployments in private clouds will remain relatively flat. Non-cloud applications will almost entirely migrate to cloud environments and most often to hosted private cloud.



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Global outlook on cloud native: present and future

66% 

66 percent of companies overall are exploring cloud-native development.

55% 

55 percent of apps developed in the next 12 months will be designed as cloud-native.

75% 

75 percent of existing non-cloud apps will move to cloud environments in the next three years.

1 in 3 

66 percent of companies overall are exploring cloud-native development.

25% 

25 percent of existing cloud apps will be completely rebuilt as cloud-native apps.

42% 

42 percent of existing cloud apps will be extended with new features and functions.

Design your first project

Evaluate your use of cloud-related development technologies

Gauge your team's level of readiness.

→ Take the self-assessment

View the interactive experience

→ Read online

About the research

In 2018, IBM conducted research with 152 IT decision makers, developers and developer executives. The study focused on organizations that develop applications internally to support their business activities, with nearly two-thirds of respondents from large enterprises with more than 1,000 employees. This report highlights the main benefits, drivers and challenges reflected in the responses of current and planned adopters. The survey was conducted online and respondents did not know the study was sponsored by IBM.

Produced in the United States of America, September 2018

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