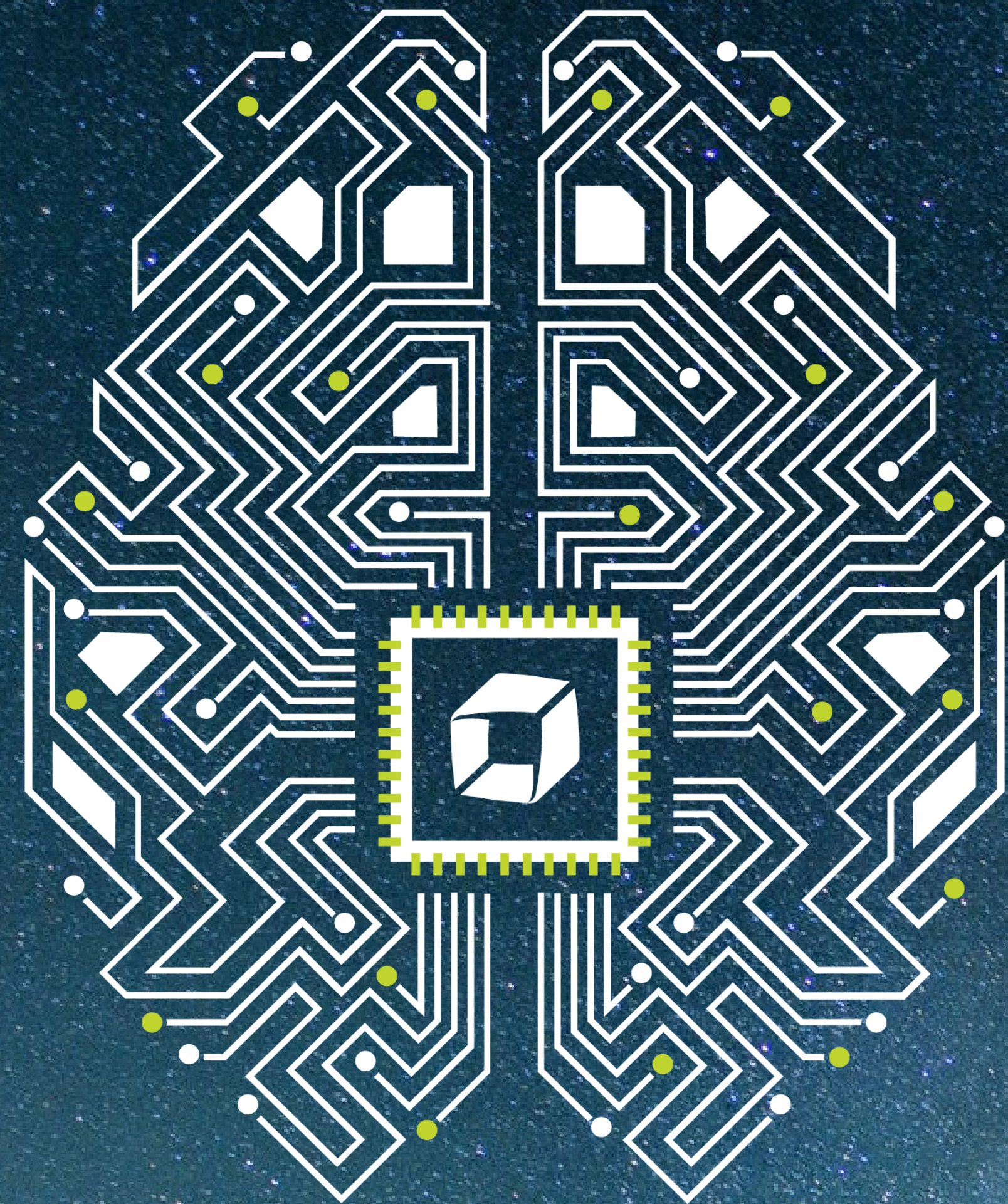# Lost in the Cloud?

Top Challenges Facing CIOs in a Cloud-Native World

The 2018 Global CIO Report

Based on a global survey of **800 CIOs,**
this report takes a closer look at the challenges
that organizations face in overcoming the hyper-
complexity of modern, cloud-centric ecosystems.

Intro

Based on a global survey of 800 CIOs, this report examines the challenges organizations face when working within complex, cloud-centric ecosystems.

Technology is at the heart of every organization today. Now more than ever, society expects the services we use to be innovative and faultless, prompting the creation of hyper-complex IT ecosystems. Relying on physical databases and third-party cloud service providers, businesses are finding it increasingly difficult to monitor application performance, ensure positive experiences, and succeed in this new environment.

Findings Summary

01.
Pressure mounts to adopt new technologies rapidly.

02.
New technologies continue to add complexity.

03.
Too much time spent on resolving digital performance problems.

Findings Summary

04.

Even solutions are problematic.

05.

Too much money spent on resolving digital performance problems.
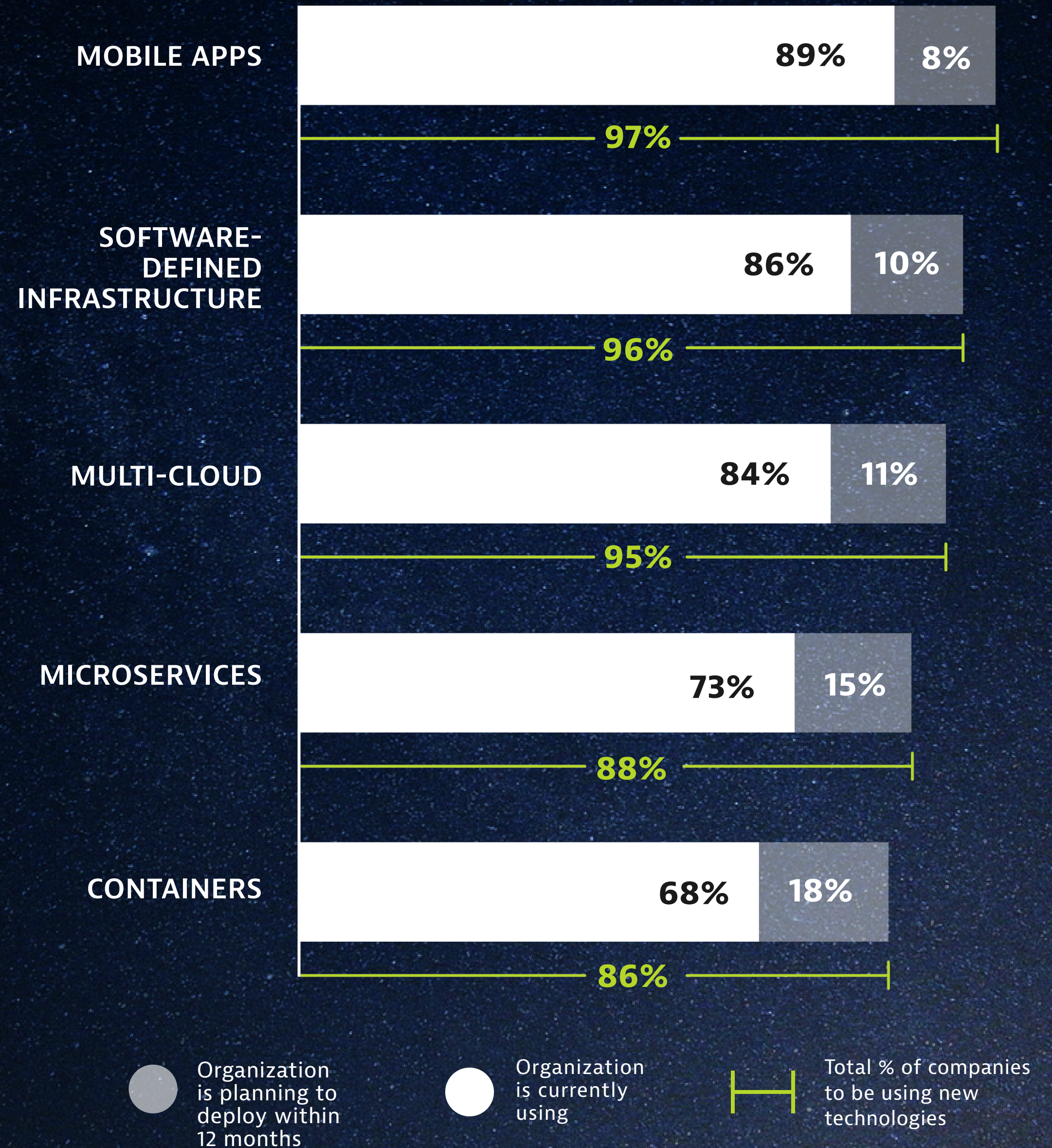
06.

AI believed to be needed in 2018 to manage hyper-complexity.

Challenge One

Pressure is mounting to adopt new technologies rapidly

Today's organizations face huge pressure to keep up with the always-on, always-connected digital economy. Consumer demand for instant access to digital services and their expectations for constant improvement and greater convenience have forced organizations into an endless cycle of innovation.

Global enterprises are adopting new technologies at a rapid rate, as they strive for the agility and cost-efficiency they need to stay ahead.

MOBILE APPS — 89% 8% — **97%**

SOFTWARE-DEFINED INFRASTRUCTURE — 86% 10% — **96%**

MULTI-CLOUD — 84% 11% — **95%**

MICROSERVICES — 73% 15% — **88%**

CONTAINERS — 68% 18% — **86%**

Organization is planning to deploy within 12 months

Organization is currently using

Total % of companies to be using new technologies

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76%

of CIOs are worried that IT complexity will make it impossible to manage performance effectively.

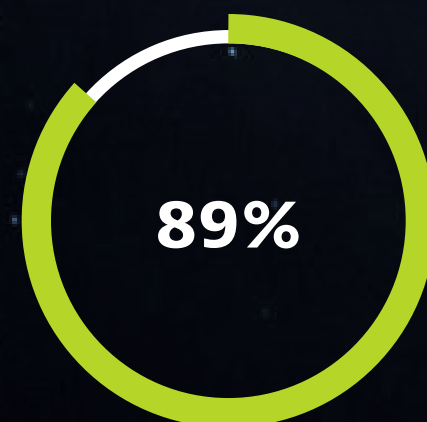Top Challenges facing CIOs in a Cloud-Native World.

Challenge Two

53% of organizations will deploy new, major technology in the next year.

76% of CIOs are worried that IT complexity will make it impossible to manage performance effectively.

89% of CIOs say the challenges of keeping a CMDB up to date in real time is making service management more difficult.

New technologies continue to add complexity

New technologies and cloud architectures only add layers of complexity to an already convoluted digital ecosystem, even with the added optimization of micro-services, containers, and software-defined infrastructure.

A single cloud-native application can consist of hundreds of micro-services and thousands of interdependencies that link it to other applications and digital services, as the number of technology systems or components needed for a single web transaction is trending upwards at an alarming rate.

Today	5 years ago
35	22

Estimated number of technology systems or components needed for a single transaction.

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73% of CIOs say confidently managing user experience is nearly impossible, due to the sheer number of factors impacting mobile performance.

Challenge Three

Too much time spent on resolving digital performance problems

Maintaining end-to-end visibility into the cloud's impact on user experience is both vital and very difficult.

Each major provider, whether AWS, Azure, or Cloud Foundry, comes with its own monitoring system, which means IT teams are forced to spend countless man hours instrumenting monitoring processes on every new cloud they throw into the mix.

Meanwhile, the performance of mobile applications can be negatively impacted by the user's network quality, operating system, signal strength, or handset type. All of which are factors that IT cannot control, but must monitor and analyze to ensure an optimized user experience.
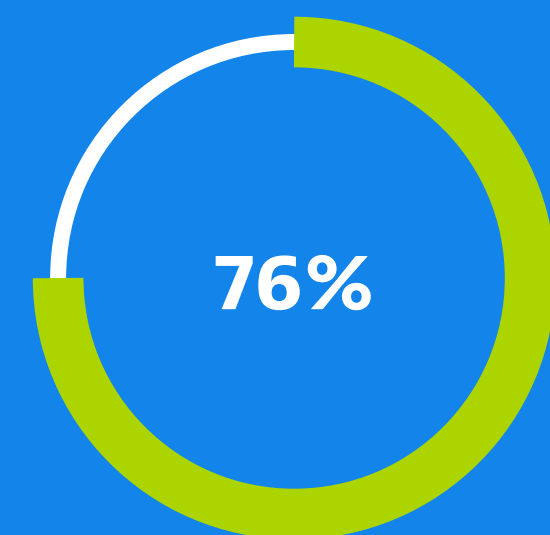
76% of CIOs say multi-cloud deployments make monitoring user experience difficult.
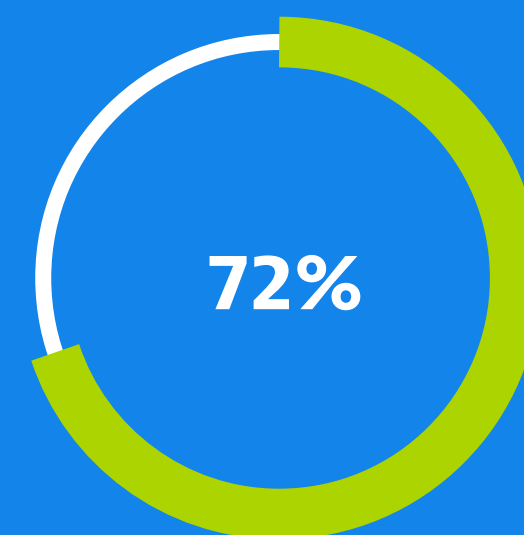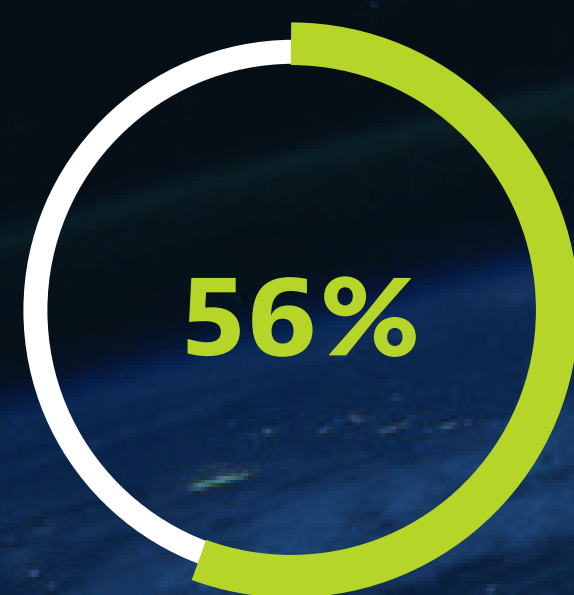
72% of CIOs are frustrated that IT teams must spend time setting up monitoring for different providers.
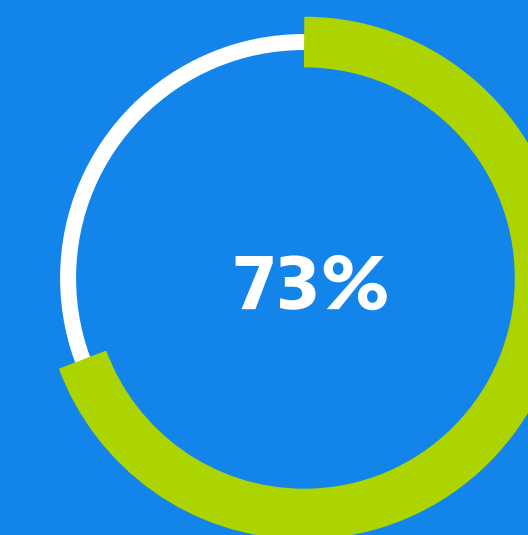
73% of CIOs say confidently managing user experience is nearly impossible, due to outside factors.

On average, resolving digital performance problems costs an organization **$2.5 million**

Top challenges of managing micro-service performance in containerized environments

56%

maintaining and configuring performance monitoring

54%

identifying service dependencies and interactions

53%

limited visibility into the micro-service layer

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Top Challenges facing CIOs in a Cloud-Native World.

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Challenge Four

Even solutions are problematic

Organizations are transforming their legacy applications into micro-services and containerized infrastructure, maximizing their benefits while bringing a phenomenal level of complexity into the mix.

The 'black box' nature of containers obscures visibility into the performance of micro-services within the system, creating an impossible job for those tasked with managing the user experience.

Businesses planning to deploy in the next twelve months

Micro-services **15%**

Containers **18%**

72% of CIOs say monitoring micro-services in real-time is almost impossible.

84% of CIOs say identifying impacts of container resource consumption on performance is difficult.

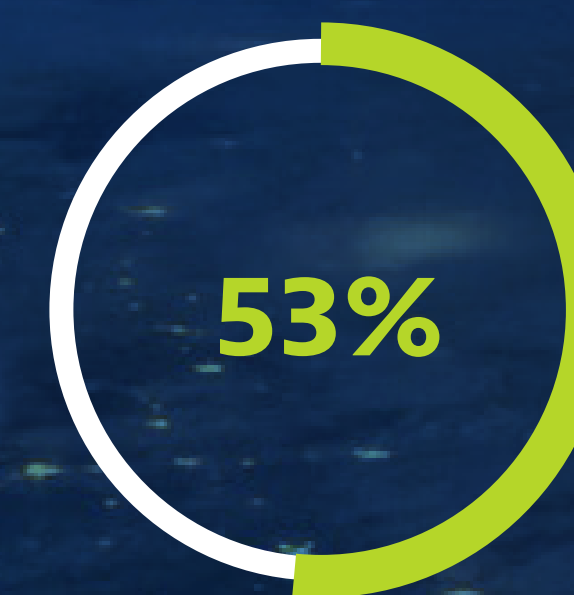**Top challenges of managing micro-service performance in containerized environments**

56% maintaining and configuring performance monitoring

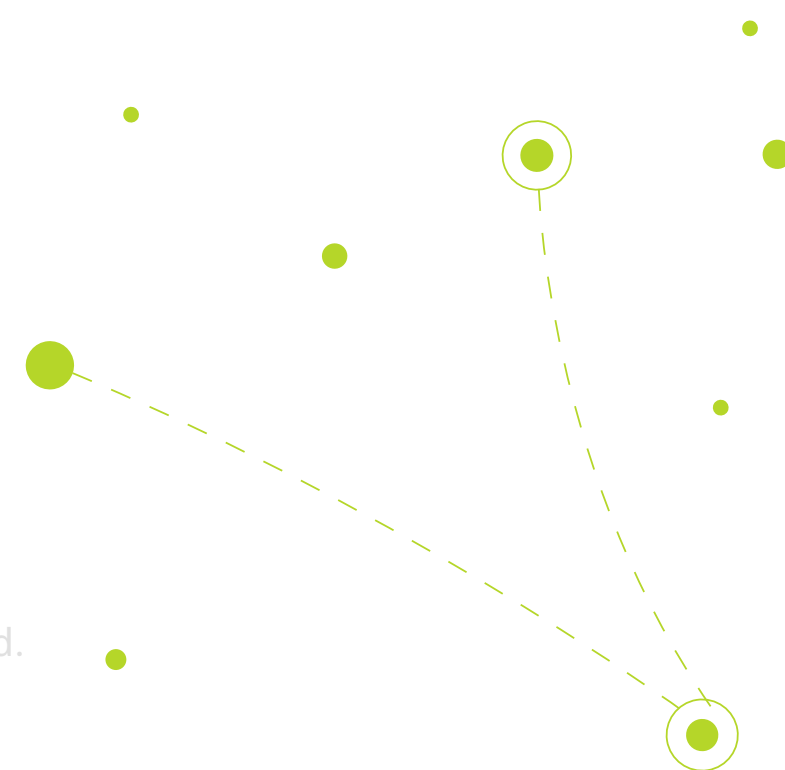**54%** identifying service dependencies and interactions

53% limited visibility into the micro-service layer

Challenge Five

Too much money spent on resolving digital performance problems

Hyper-complexity poses problems across enterprises, so it's no surprise that IT teams are suddenly being called upon to explain dips in sales or to prepare compliance teams for new regulatory requirements.

As a result, these teams are spending more and more time fighting fires and scrambling for answers across a sea of departments, creating a major drain on the innovation needed to stay one step ahead of the competition.

29%
of IT teams' work time is spent dealing with digital performance problems.

Resolving digital performance problems costs an organization, on average,
$2.5 million*

*Based on the average organizational spend on IT salaries and the percentage of time spent by IT teams collectively dealing with digital performance problems.

According to CIOs...
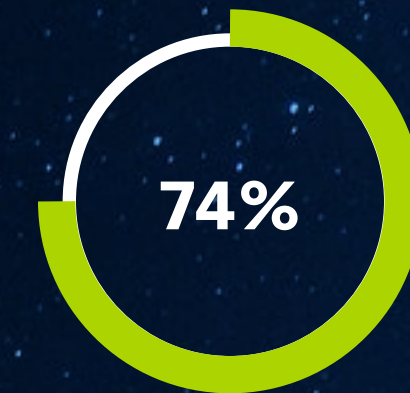
74% of CIOs say IT is under too much pressure to keep up with unrealistic demands from the business and end users
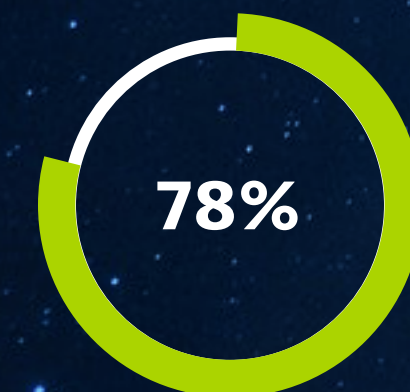
78% of CIOs feel it's harder to find time and resources to answer the range of questions the business asks, whilst delivering on everything else that is expected of IT
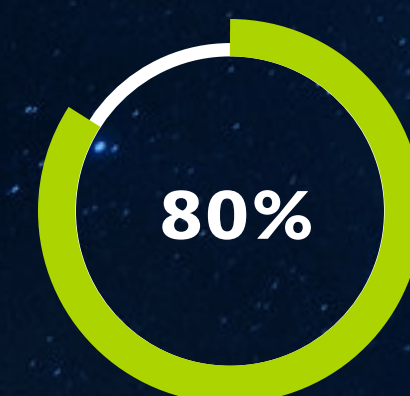
80% of CIOs agree that it is difficult to successfully map the impact of digital performance on business.

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Challenge Six

AI believed to be needed in 2018 to manage hyper-complexity

The fact is humans can no longer handle the data being generated by their own systems. Nor can they map an evolving and adapting environment that exists solely in the cloud. So, what's the answer?

Advances in artificial intelligence (AI) capabilities are being deployed as a lifeline for organizations looking to master the hyper-complexity of their IT environments, delivering teams the ability to instantly analyze and understand the millions of interdependencies existing between cloud applications and the multi-cloud infrastructure that underpins them.

**Within the next year, the majority of CIOs will deploy solutions that allow their teams to automate the resolution of performance problems before users are even impacted, optimizing user experience and evening the odds by tackling a next-generation problem with a next-generation solution.**

81%
of CIOs feel AI will be critical to mastering increasing IT complexity.

83%
of CIOs either have or will deploy AI in the next 12 months.

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Results by Country:
Challenge One

GLOBAL

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	89%	8%
Software-defined infrastructure	86%	10%
Multi-cloud	84%	11%
Microservices	73%	15%
Containers	68%	18%

U.S.

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	89%	9%
Software-defined infrastructure	92%	6%
Multi-cloud	88%	8%
Microservices	72%	17%
Containers	69%	17%

UK

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	85%	10%
Software-defined infrastructure	78%	15%
Multi-cloud	81%	13%
Microservices	60%	14%
Containers	56%	18%

FRANCE

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	88%	8%
Software-defined infrastructure	83%	11%
Multi-cloud	86%	5%
Microservices	73%	17%
Containers	66%	17%

GERMANY

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	90%	7%
Software-defined infrastructure	81%	13%
Multi-cloud	84%	10%
Microservices	76%	17%
Containers	69%	20%

CHINA

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	93%	7%
Software-defined infrastructure	89%	7%
Multi-cloud	84%	14%
Microservices	80%	16%
Containers	75%	19%

Results by Country:
Challenge One

AUSTRALIA

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	92%	0%
Software-defined infrastructure	86%	4%
Multi-cloud	78%	18%
Microservices	68%	12%
Containers	58%	18%

SINGAPORE

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	96%	2%
Software-defined infrastructure	74%	20%
Multi-cloud	74%	24%
Microservices	76%	14%
Containers	68%	20%

BRAZIL

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	92%	8%
Software-defined infrastructure	94%	6%
Multi-cloud	88%	12%
Microservices	92%	8%
Containers	82%	14%

MEXICO

Technology	Organization is currently using	Organization is planning to deploy within 12 months
Mobile Apps	80%	16%
Software-defined infrastructure	84%	14%
Multi-cloud	82%	12%
Microservices	70%	16%
Containers	70%	16%

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Results by Country:
Challenge Two

Average estimated number of different technology systems or components that a single transaction on a web or mobile application touches now versus five years ago.

Country	Today	5 years ago
GLOBAL	35	22
U.S.	34	26
UK	28	14
FRANCE	38	26
GERMANY	29	12
CHINA	46	23
AUSTRALIA	22	13
SINGAPORE	20	13
BRAZIL	42	53
MEXICO	62	27

■ Today

□ 5 years ago

Results by Country:
Challenge Two

GLOBAL	**53**%	**76**%	**89**%
U.S.	**49**%	**81**%	**92**%
UK	**56**%	**61**%	**92**%
FRANCE	**56**%	**79**%	**91**%
GERMANY	**56**%	**67**%	**84**%
CHINA	**60**%	**66**%	**78**%
AUSTRALIA	**40**%	**94**%	**96**%
SINGAPORE	**62**%	**82**%	**92**%
BRAZIL	**36**%	**88**%	**84**%
MEXICO	**60**%	**82**%	**88**%

Organizations that are planning to deploy a new technology in the next 12 months

CIOs are concerned that rising IT complexity could soon make it impossible to manage performance efficiently and effectively

CIOs say increasing complexity and the challenges of keeping a CMDB up to date in real time is making service management more difficult

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Challenge Three

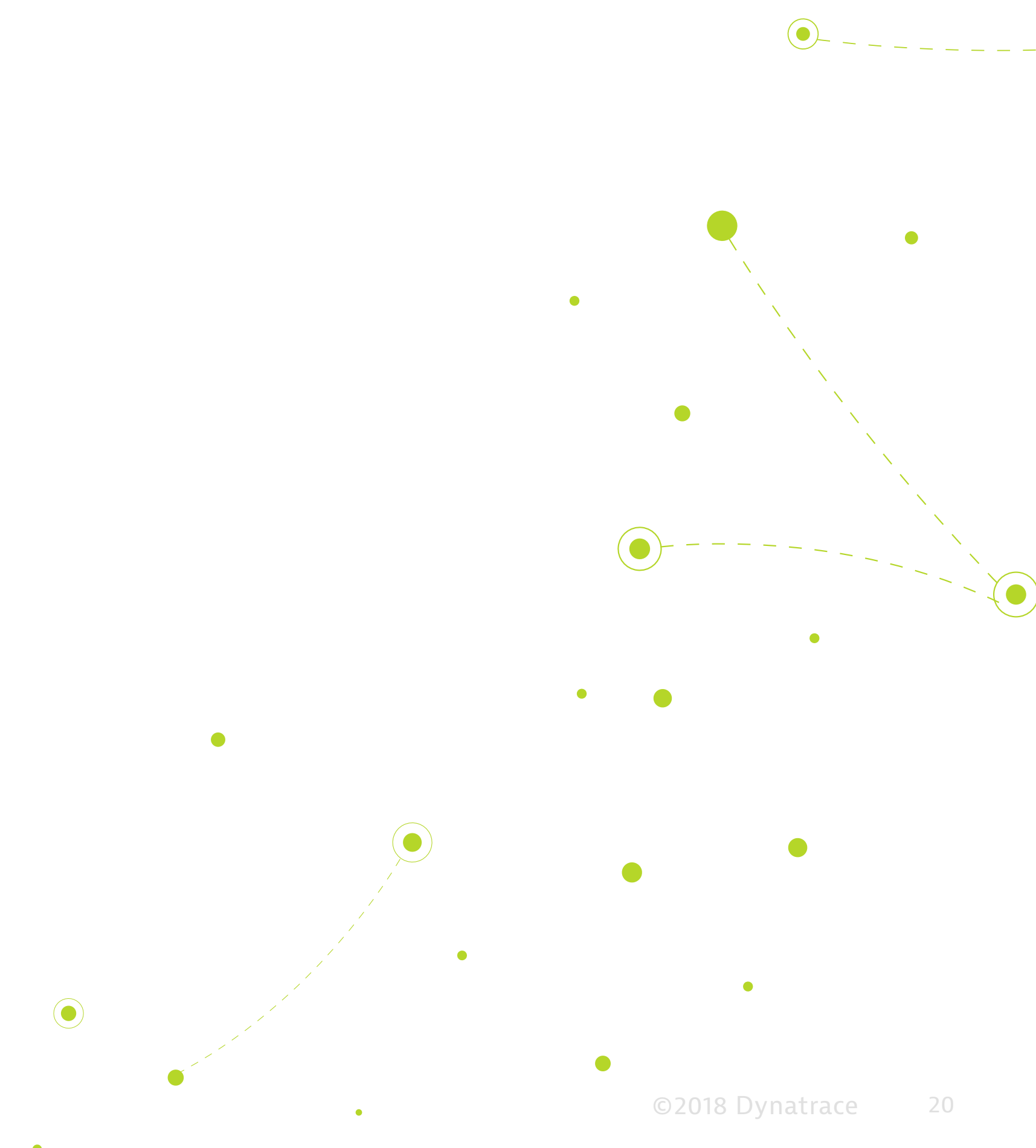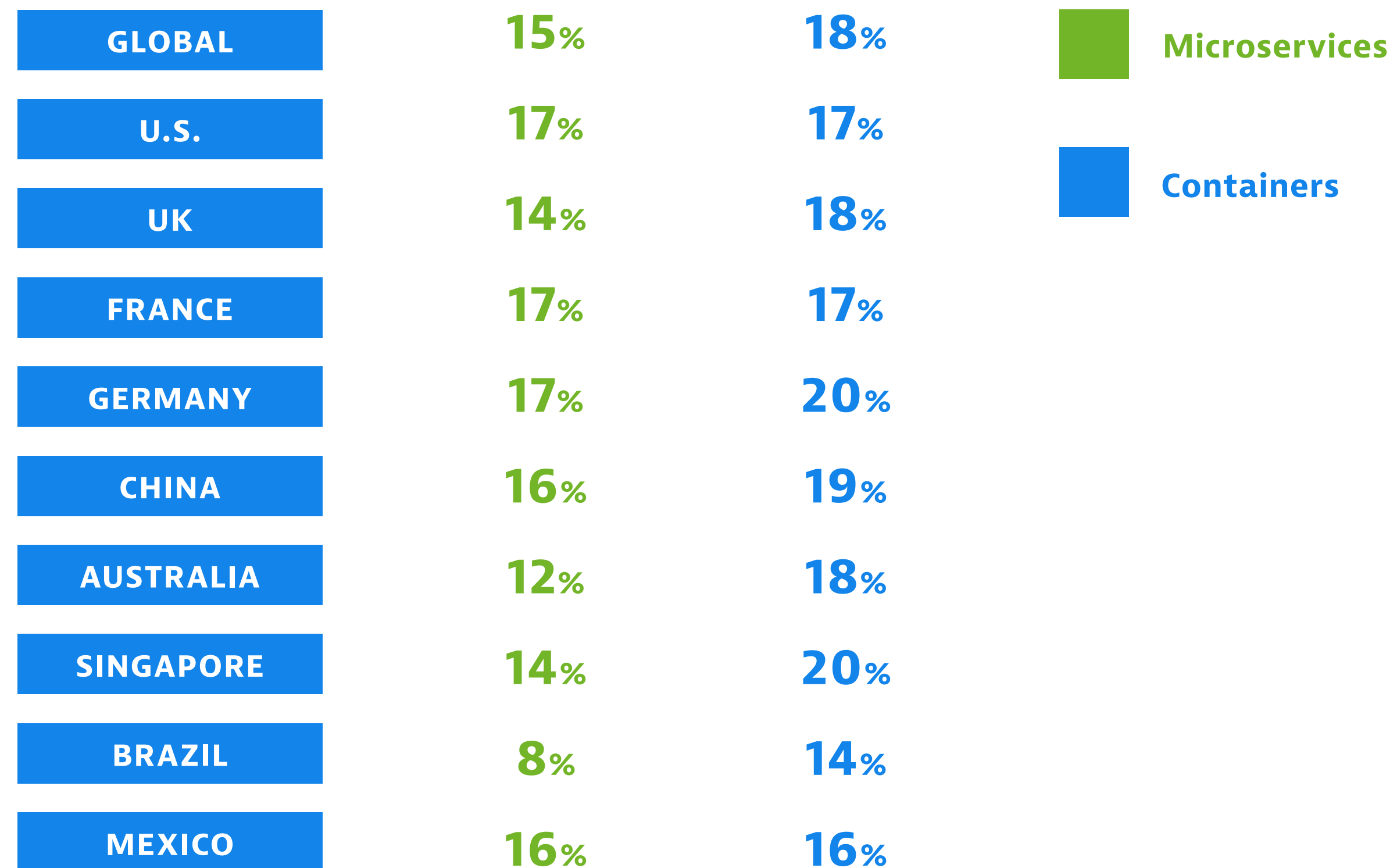|			
GLOBAL	**76**%	**72**%	**73**%
U.S.	**78**%	**83**%	**74**%
UK	**74**%	**69**%	**73**%
FRANCE	**79**%	**73**%	**72**%
GERMANY	**70**%	**64**%	**67**%
CHINA	**68**%	**58**%	**65**%
AUSTRALIA	**86**%	**86**%	**84**%
SINGAPORE	**92**%	**84**%	**84**%
BRAZIL	**68**%	**74**%	**76**%
MEXICO	**68**%	**56**%	**78**%

CIOs find that multi-cloud deployments (and the need to instrument monitoring for each provider/service) make it especially difficult and time-consuming to monitor and understand the impact that cloud services have on the user-experience

CIOs find it a frustration that IT teams have to spend so much time setting-up monitoring for different cloud environments/ providers when deploying new services

CIOs say that the sheer number of factors impacting mobile performance outside of their control makes it nearly impossible to manage the user-experience with confidence

Challenge Four

Business planning to deploy microservices and/or containers in the next 12 months

	Microservices	Containers
GLOBAL	15%	18%
U.S.	17%	17%
UK	14%	18%
FRANCE	17%	17%
GERMANY	17%	20%
CHINA	16%	19%
AUSTRALIA	12%	18%
SINGAPORE	14%	20%
BRAZIL	8%	14%
MEXICO	16%	16%

■ **Microservices**

■ **Containers**

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Results by Country:
Challenge Four

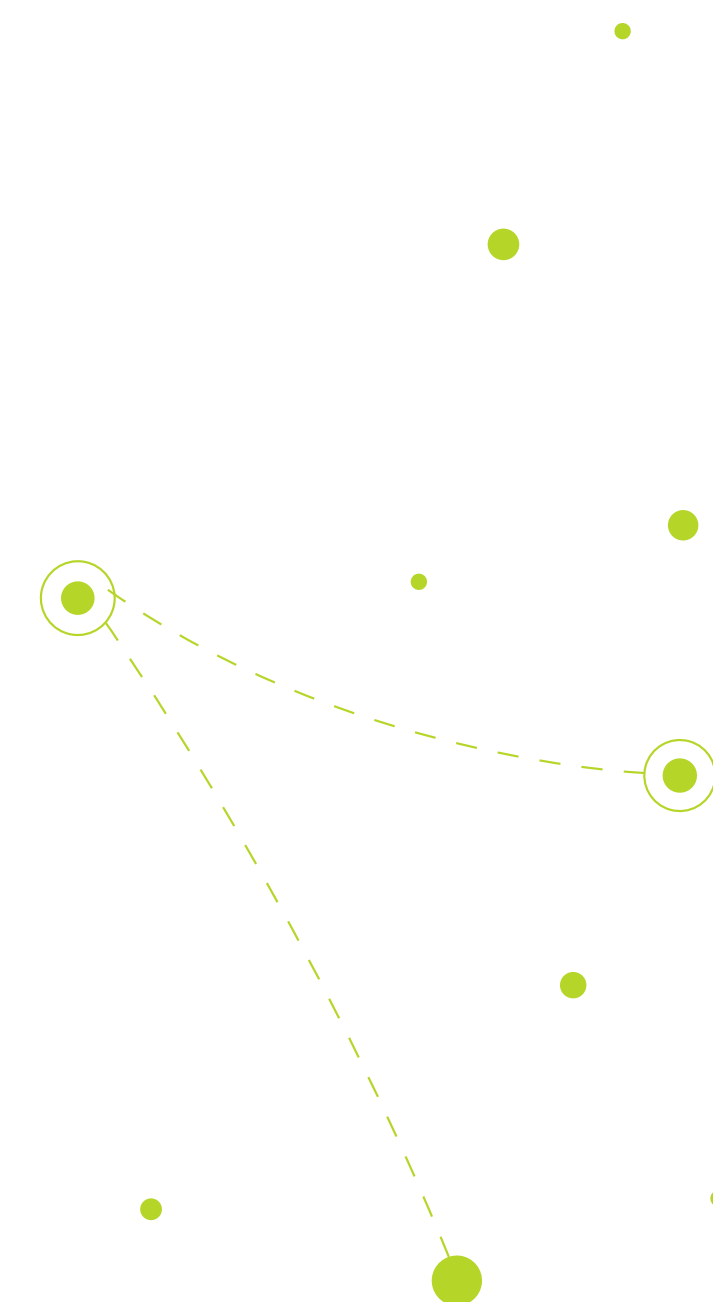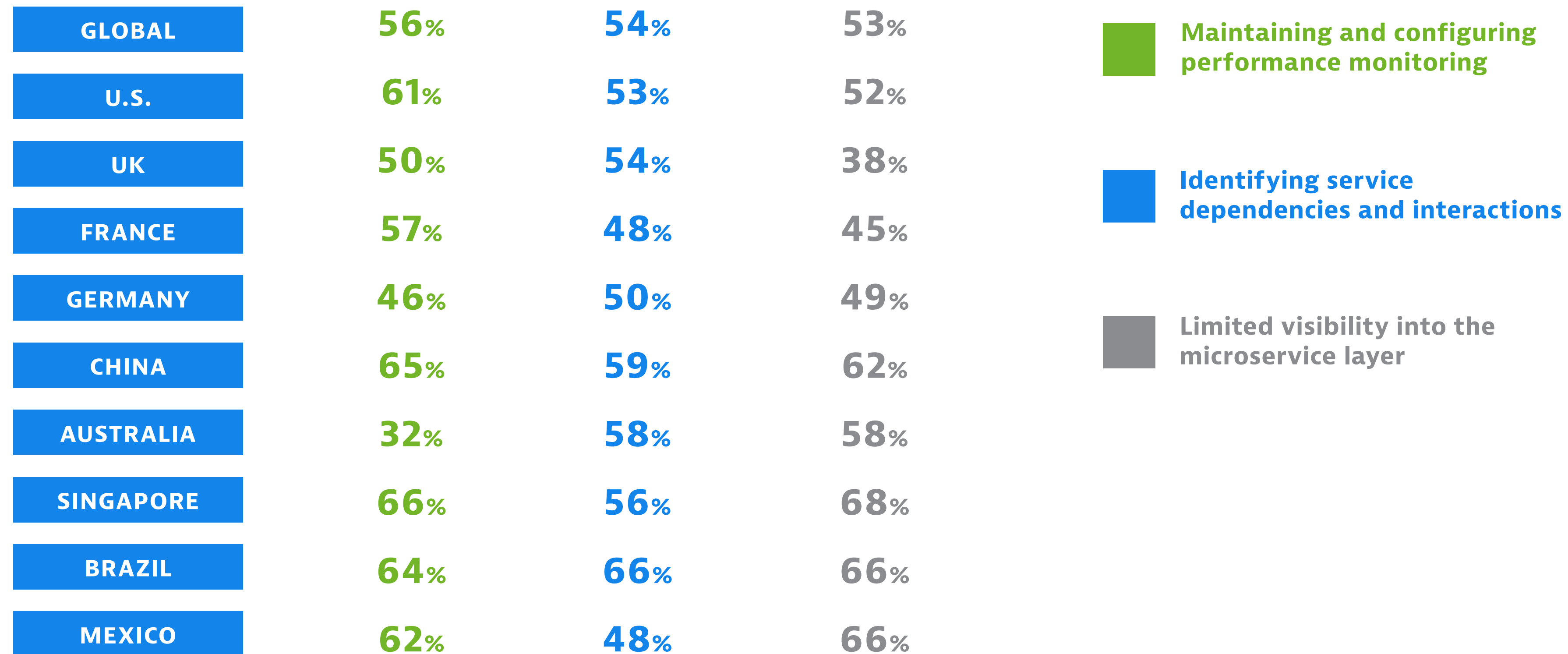|		
GLOBAL	**72**%	**84**%
U.S.	**79**%	**82**%
UK	**74**%	**76**%
FRANCE	**57**%	**88**%
GERMANY	**75**%	**80**%
CHINA	**54**%	**88**%
AUSTRALIA	**94**%	**96**%
SINGAPORE	**78**%	**90**%
BRAZIL	**72**%	**86**%
MEXICO	**80**%	**76**%

■ **CIOs say monitoring the performance of microservices in real-time is almost impossible**

■ **CIOs say it is difficult to quickly identify any impact that container resource consumption has on application performance**
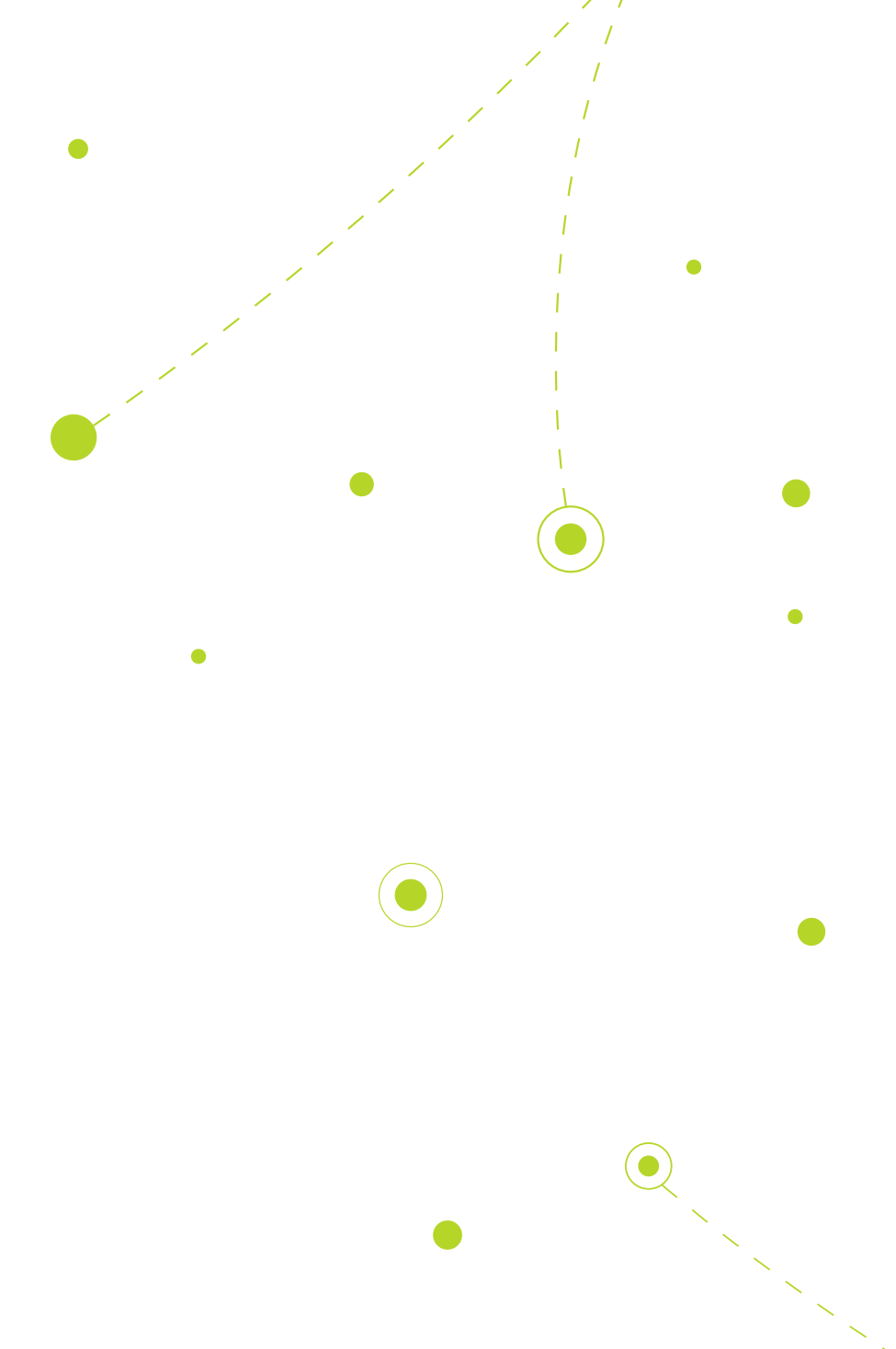
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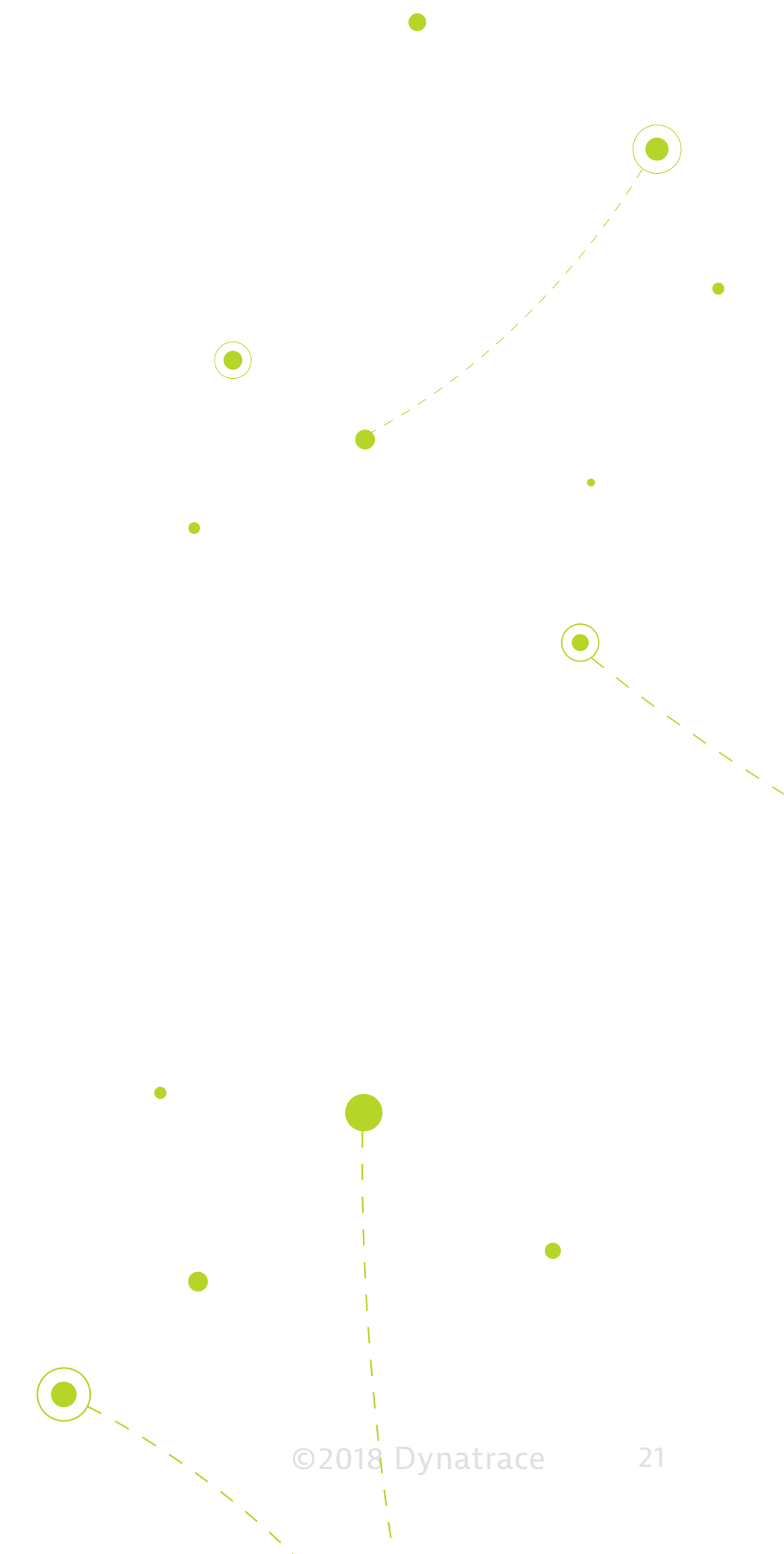
Results by Country:
Challenge Four

Top three challenges of managing the performance of microservices in containerized environments.

GLOBAL	56%	54%	53%
U.S.	61%	53%	52%
UK	50%	54%	38%
FRANCE	57%	48%	45%
GERMANY	46%	50%	49%
CHINA	65%	59%	62%
AUSTRALIA	32%	58%	58%
SINGAPORE	66%	56%	68%
BRAZIL	64%	66%	66%
MEXICO	62%	48%	66%

■ **Maintaining and configuring performance monitoring**

■ **Identifying service dependencies and interactions**

■ **Limited visibility into the microservice layer**

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Results by Country:
Challenge Five

GLOBAL	74%	78%	80%
U.S.	75%	83%	85%
UK	70%	77%	79%
FRANCE	72%	77%	81%
GERMANY	64%	73%	76%
CHINA	74%	76%	70%
AUSTRALIA	94%	88%	92%
SINGAPORE	78%	88%	90%
BRAZIL	80%	74%	74%
MEXICO	72%	62%	74%

■ **CIOs say IT is under too much pressure to keep up with unrealistic demands from the business and end users**

■ **CIOs say it is getting harder to find time and resources to answer the range of questions the business asks, whilst delivering on everything else that is expected of IT**

■ **CIOs agree that it is difficult to map the technical metrics of digital performance to the impact they have on the business**

Results by Country:
Challenge Five

GLOBAL	**29**%	**$2.52**
U.S.	**31**%	**$2.45**
UK	**25**%	**$5.22**
FRANCE	**28**%	**$1.94**
GERMANY	**28**%	**$2.08**
CHINA	**32**%	**$1.62**
AUSTRALIA	**33**%	**$2.36**
SINGAPORE	**30**%	**$2.54**
BRAZIL	**29**%	**$2.13**
MEXICO	**24**%	**$0.92**

Average % of their time that IT teams spend dealing with digital performance problems

Average cost to organizations of resolving digital performance problems (million)

Results by Country:
Challenge Six

GLOBAL	81%	83%
U.S.	83%	82%
UK	72%	72%
FRANCE	84%	83%
GERMANY	65%	85%
CHINA	95%	96%
AUSTRALIA	80%	74%
SINGAPORE	88%	82%
BRAZIL	78%	94%
MEXICO	92%	84%

■ CIOs think AI will be critical to IT's ability to master increasing IT complexity

■ CIOs either have, or will deploy AI in the next 12 months

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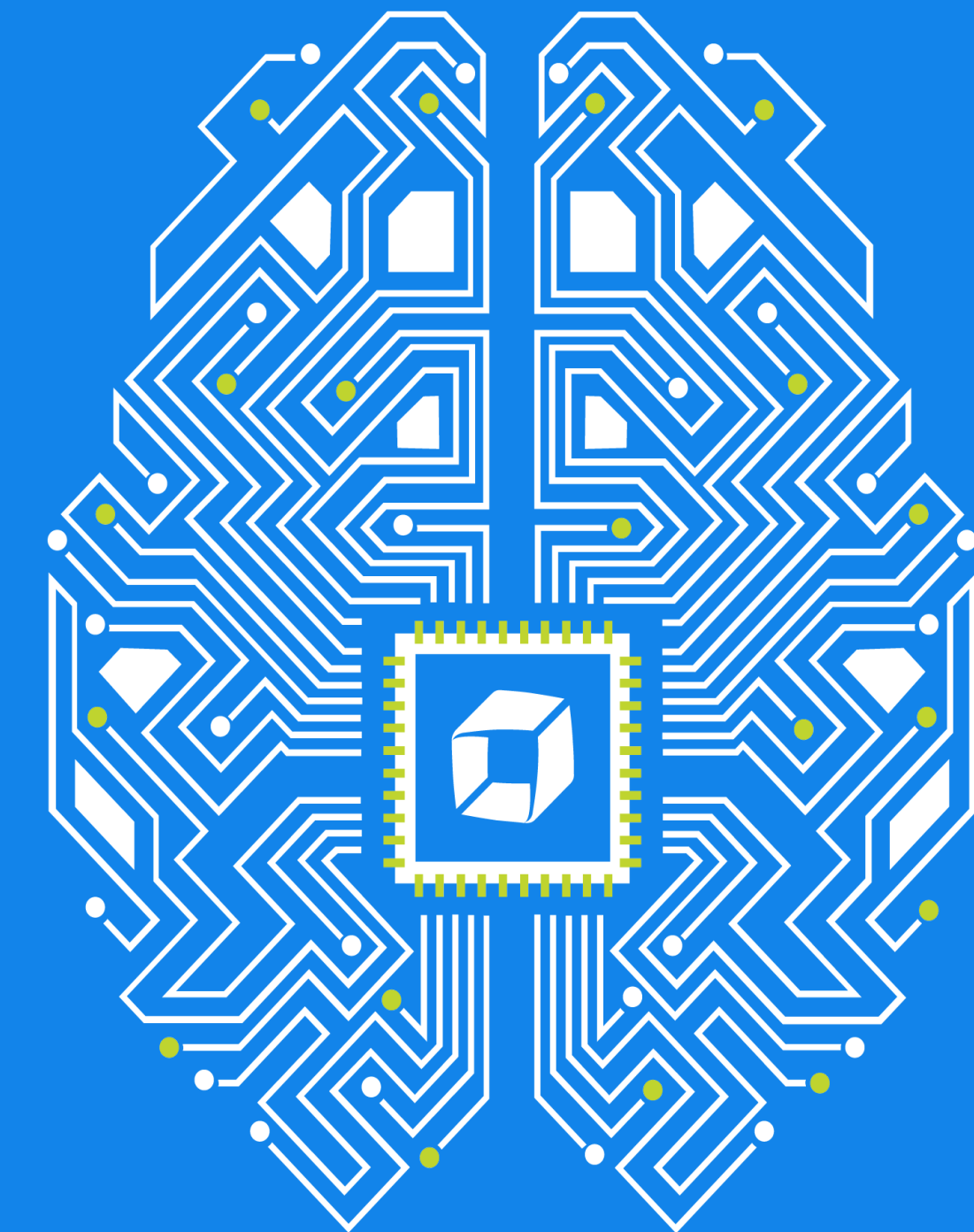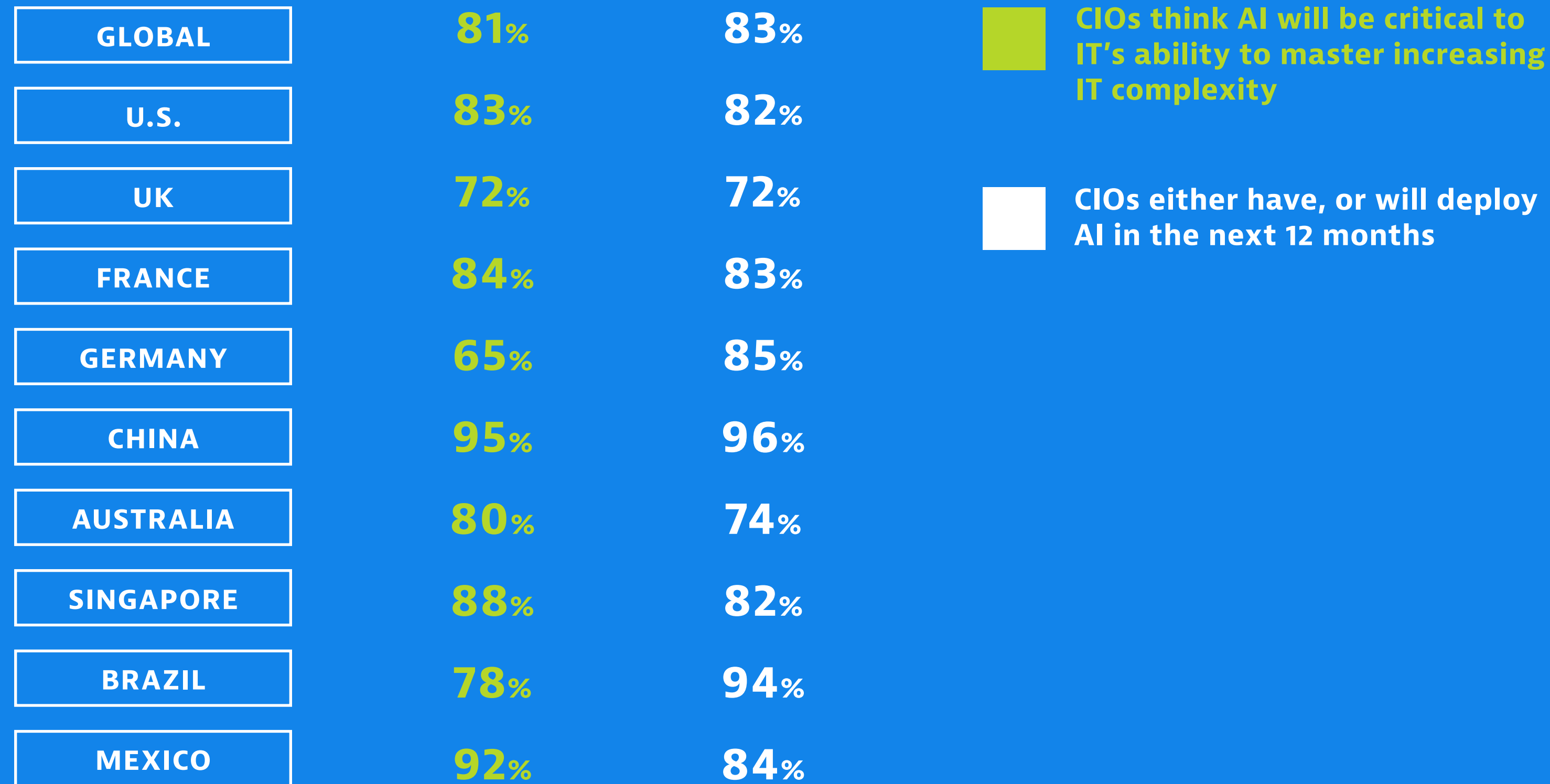
Methodology

This report is based on a global survey of 800 CIOs in large enterprises with over 1,000 employees, conducted by Vanson Bourne and commissioned by Dynatrace.
The sample included 200 respondents in the U.S., 100 in the UK, France, Germany and China, and 50 in Australia, Singapore, Brazil and Mexico respectively.

Learn more at dynatrace.com

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