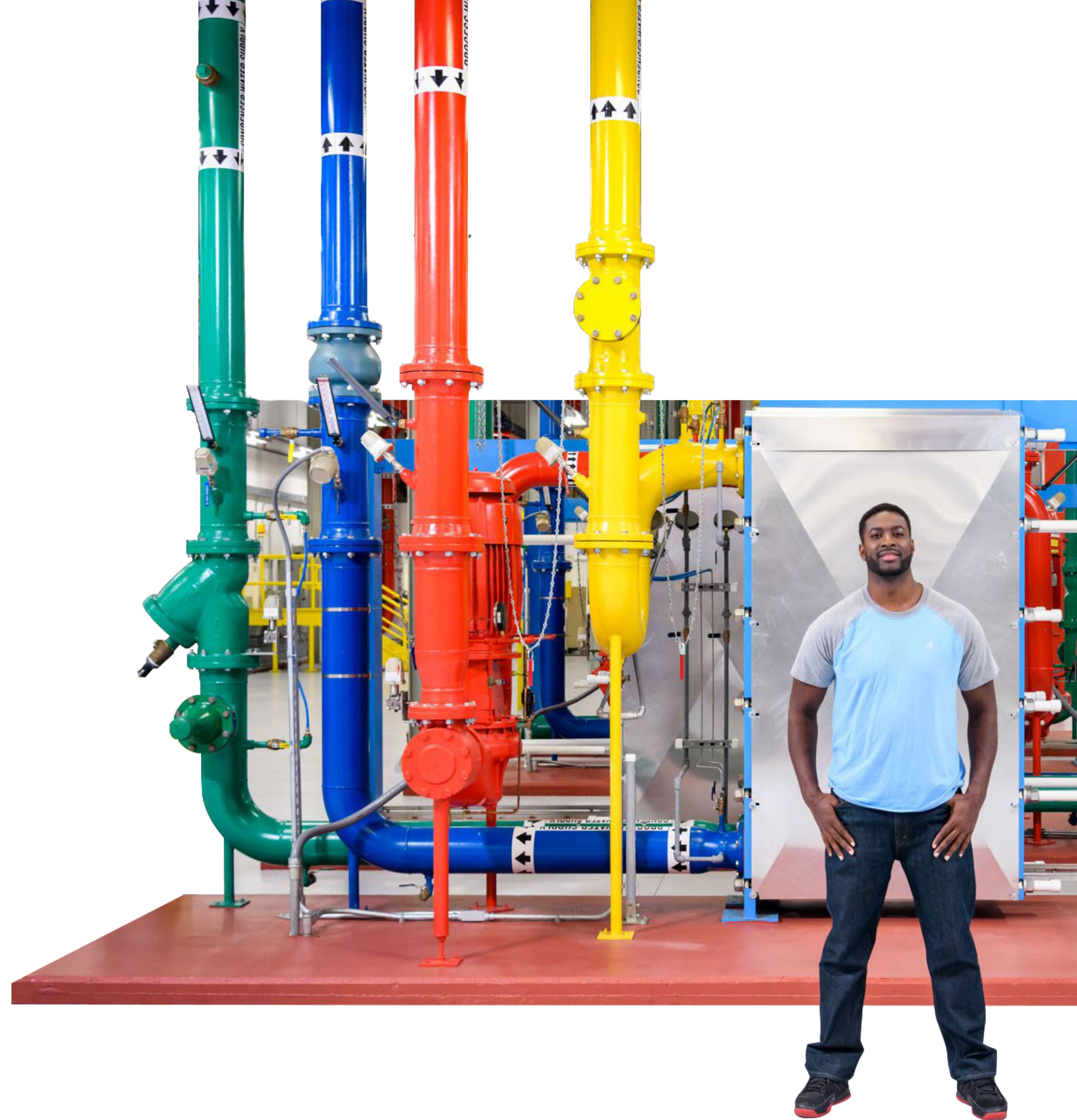# Future of cloud computing

A view of the future of cloud computing, through the eyes of the luminaries who helped build it.

Google Cloud

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A stake in the future

Here at Google, we spend a lot of time looking at data and anticipating what will happen next. When it comes to the future of business, we get some of our best ideas by looking at new information technologies and thinking about their effects. Cloud computing has long powered Google and is increasingly an integral part of most organizations' technology stacks.

But the cloud's more than a new generation of machines and software. As cloud computing moves into widespread use, it has the potential to transform everything from product strategy to customer relationships to entire office cultures, even for companies that look very different from Google. We're already seeing that transformation happen to the billions of users and millions of companies that rely on our technology.

What makes us think that cloud computing will change things beyond IT itself? History argues for it. Mainframe computers made operations research possible. The PC revolution made anyone a potential entrepreneur. Client-server enabled corporate reengineering and smartphones created the app economy and computing from almost anywhere.

The cloud, we believe, draws on more diverse data sources, breaks down more silos, and utilizes faster network speeds and more powerful analyses, all at a lower cost than anything tech has seen before. This creates something new: a cloud-first world, where new capabilities mean new kinds of product creation, new partnerships, and new ways of working.

Urs Hölzle

SVP Technical Infrastructure,
Google Cloud

As with any momentous change, business leaders must navigate the here and now with an eye towards the future. In many ways, leading companies must strive for an even more elevated view as they embark on their business transformation journey.

Google's mission is to organize the world's information and make it universally accessible and useful. The company was founded back in 1998, before anyone could have predicted how fundamental the changes would be in how humans access and consume information. Along the way, we've helped shape the evolution of how cloud computing works with customers. Our advances in areas like analytics and machine learning power data collection and productivity, and our security innovations protect billions of users' data. It's been 20 years now, but these changes are far from over. In fact, for many companies, they're just beginning.

This is why we assembled this report – to help business and IT leaders navigate the changing business world with cloud computing. We gathered insights from users, conversations with businesses of all sizes, surveys, polls, and from Google itself to offer you a holistic view of the current landscape and where it's already going in terms of value, innovation, and competition.

The goal is to give you the insights you need to craft winning strategies for a cloud-first world. We hope that you can put these examples from real companies, current market trends, and learnings from Google executives to good use, and as always, we look forward to partnering with you on whatever comes next.

— Urs Hölzle, SVP Technical Infrastructure, Google Cloud

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PART 1

Introducing the cloud-first future

What makes new computing technologies great? It's not just networking speeds, compute power, or storage capacity. Those are critical minimums, and cloud computing can deliver them far more effectively than previous methods. There is more, however. The real value of technology is not what it's made of, but what it does.

This is why so much of the economy runs on and was shaped by evolving technologies. For a reasonable investment, technology has provided benefits like empowerment, improved teamwork, and services on demand. In fact, some technologies – like cloud computing – offer all of this at a lower overall cost than their traditional alternatives.

A decade since businesses first started to run on public clouds, many have discovered that cost savings were just the beginning. Our customers are creating businesses that are continuous and nearly frictionless, maximizing their organizations' missions with faster times to insight and action. They are realizing something new in cloud computing: speed, efficiency, reliability, and security in service of a new wave of business-driven innovation.

If the value of a technology is the net experience it delivers to the enterprise – on cost, on performance, and on time to innovation – it's clear why so many believe that the cloud computing's interconnected, continuous streaming will be an important part of our future economy. In other words, the future will be cloud-first.

In the following pages, we'll explore:

1   What a cloud-first world means (and why it matters)

2   How a cloud-first world emerges within the enterprise

3   What the business impacts of a cloud-first world will be

**4**   How business and IT leaders can prepare

From the data center, to the cloud, to the edge

Cloud computing is already an integral part of most organizations. According to a survey by RightScale[1], 81 percent of companies with 1,000 employees or more have a multi-platform strategy. By 2024, that number is expected to climb to more than 90 percent.[2] Between 2018 and 2021, worldwide spending on public cloud services is expected to grow 73 percent from $160 billion to $277 billion.[3]

Companies are moving to the cloud because it offers the agility they need to compete in a fast-moving, rapidly changing customer environment. Cloud saves companies the cost of maintaining their own internal systems; it drives innovation by making it easier to develop and change applications on the fly; and it helps standardize and simplify security management.

The next few years, according to data from analyst firms Gartner and IDC, will see cloud computing continue to evolve as part of a stack that includes the Internet of Things (IoT) and edge computing, or processing at the source of data ingestion. Gartner[4] predicts that by 2022, 75 percent of enterprise-generated data is created and processed outside a traditional centralized data center or cloud. In addition, more than 40 percent of organizations' cloud deployment will include edge computing, and 25 percent of endpoint devices will execute AI algorithms by 2022, according to IDC.[5]

The growing cloud

90%+
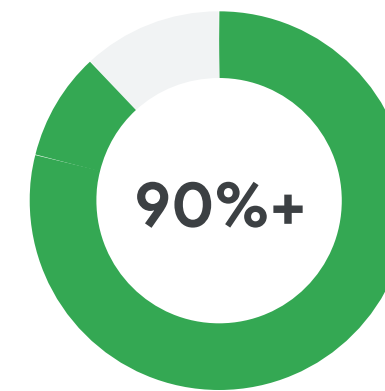
By 2024, most enterprises will have intensively **multi-cloud** environments, with on-prem, off-prem, public, and private cloud.[6]

| 2018 | $160 billion |
| 2020 | $277 billion |

Global spending for public cloud services is on track to be **$277 billion** in 2020.[7]

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Download the full report