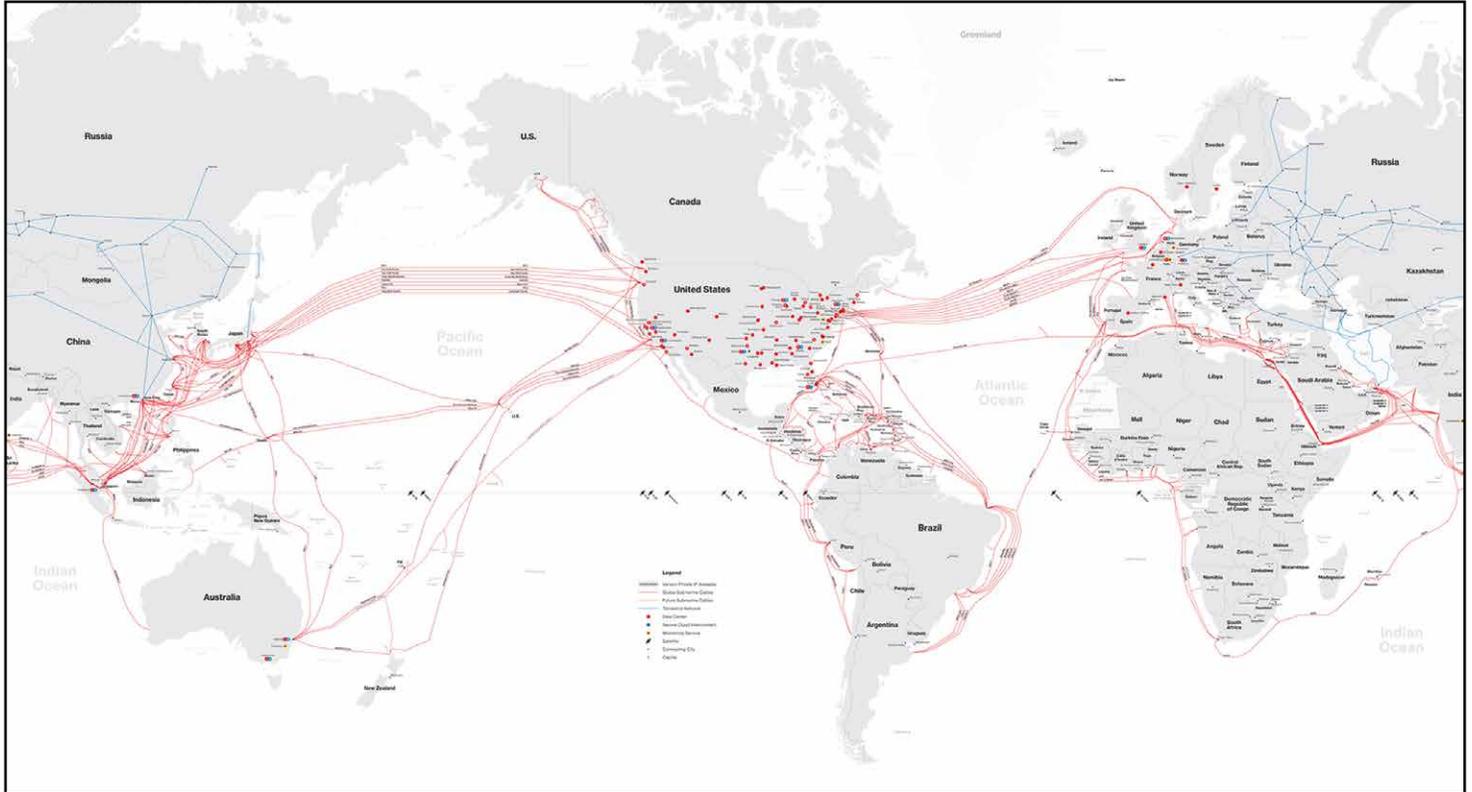


Move fast, stay ahead.

Embracing the
disruptive power
of software-defined
networking



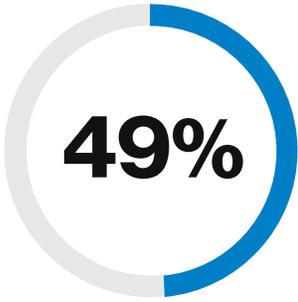
Speed, scale, agility: Get ahead with software-defined networking.



How do large enterprises innovate, scale and deploy at speed while keeping costs under control and staying secure? For many organizations, software-defined networking (SDN) now represents one part of the answer, offering an innovative approach to designing, building and managing communications networks.

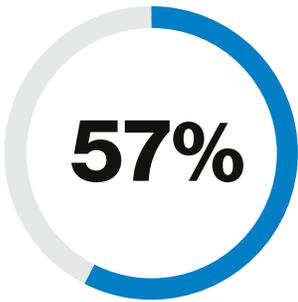
The promise of SDN is elastic, scalable, network-wide service creation and near real-time service delivery. By allocating resources more efficiently and automating network operations, the emerging technology can be a crucial enabler of business model agility.

In this report, we chart the ambitious plans many organizations now have to implement SDN technologies. We look at what they hope to achieve, as well as the challenges they expect to encounter.



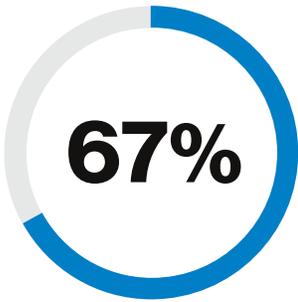
SDN will meet a clear need.

Almost half of organizations say one trigger for adoption is an imperative to scale network functionality. Read more on page 5.



SDN deployment is accelerating.

Fifteen percent of organizations have already deployed SDN or are currently piloting it. That's expected to rise to 57% within two years. Read more on page 4.



Implementation barriers are a concern.

Two-thirds of organizations are concerned about the potential for disruption during the migration process. Read more on page 8.

About this research

This research was carried out by Longitude, a *Financial Times* company. The report is based on a survey of 165 senior IT leaders in a broad range of industry sectors and headquartered around the world: 31% of respondents are based in North America; 33% are based in Europe; 36% are based in the Asia-Pacific (APAC) region.

It also draws on in-depth interviews with five senior IT executives at global organizations in retail, oil and gas, financial services, legal, and construction.

- Some 26% of organizations surveyed have global revenues of \$200 M to \$499 M
- Fifty-three percent have global revenues of \$500 M to \$999 M
- Twelve percent have global revenues of \$1 B to \$9.9 B
- Nine percent have global revenues in excess of \$10 B

The survey was conducted during the first quarter of 2018.

First movers are accelerating SDN deployment.

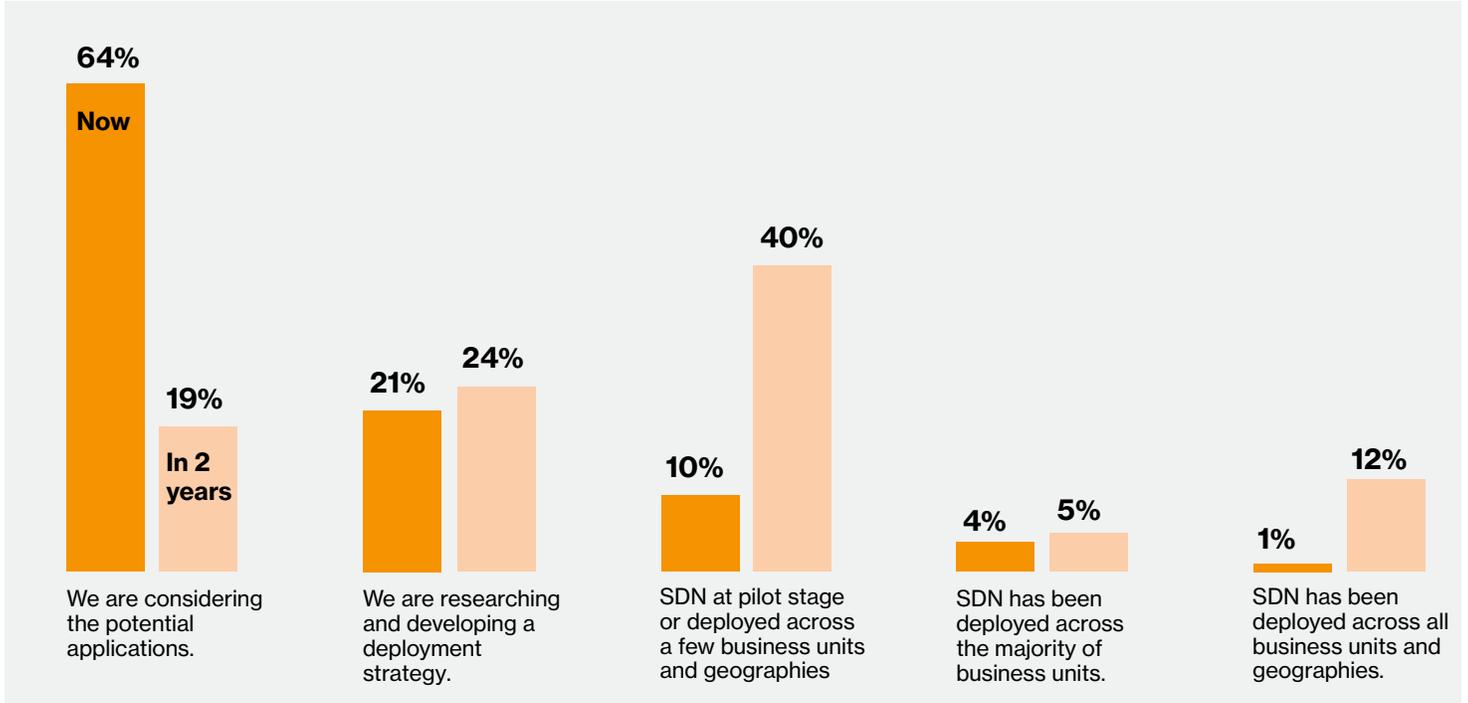


Figure 1. To what extent has SDN been deployed across your organization so far? And to what extent do you expect it to have been deployed in two years' time? (n = 165)

SDN takeup is still at a relatively early stage, but on the brink of a rapid acceleration. Within two years, the number of organizations moving from considering the potential applications of SDN to piloting it will have risen significantly (see Figure 1).

Deployment rates are set to increase. The number of organizations piloting or deploying SDN technologies in at least some business units and geographies will increase from 15% today to 57% over the next two years. Moreover, while just 1% of businesses have already deployed SDN throughout their organizations, that will increase to 12% in two years' time.

“Increased deployment is inevitable,” says Mark Timbs, CIO of the UK construction, infrastructure and property group Lendlease, which has made a number of successful investments in SDN. “It’s already proving invaluable in remote places because it’s reducing the need to get skilled technical hands into far-flung areas at short notice, but also, this is the way industries are heading in terms of their telecoms and networking providers, so the evolution toward SDN is becoming a natural one.”

Those businesses that are reluctant to embrace SDN are at risk of being left behind. Nearly a third of respondents (31%) to our survey say they would expect the deployment of SDN technologies to take between three and five years, so organizations that are still only at the consideration stage—with no fixed time frame for roll-out—may find themselves with a lot of ground to make up.

Thirty-one percent of respondents say they would expect the deployment of SDN technologies to take between three and five years.



The number of businesses piloting or deploying SDN will increase to 57% over the next two years.

Software-defined networking is a business enabler.

The urgency with which many organizations are now approaching SDN adoption reflects the realities of the market environment. Business models are evolving more quickly than ever in the face of digital disruption and rapid globalization, demanding IT infrastructure that can flex, pivot and expand in parallel.

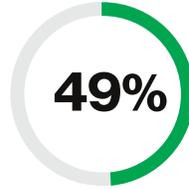
In this context, many of the most important drivers of SDN adoption cited by respondents are related to repurposing their organizations for topline growth. For example, about half (49%) highlight the need to ensure they can scale their network functionality; 44% believe SDN will give them a competitive edge and help them respond more quickly to opportunities; and the same percentage (44%) point to their need to deploy services to internal lines of business more quickly.

An interviewee at a European banking group, which is now moving toward SDN technologies, explains that capacity management is a key issue for competitive organizations. That’s because people across a business are all involved in building new applications and adding new features to products and services. The interviewee recognizes that their business needs to act now to make the necessary changes and sees SDN as a way to ensure capacity constraints don’t get in the way.

Business-model innovation is a common theme among those moving towards SDN. For example, Matt Peers, Global COO at law firm Linklaters, argues that SDN is an important tool for generating insights and enabling collaboration across the international enterprise.

“Like most organizations, we are doing a lot with the ever-increasing datasets. Having a good network that allows us to take advantage of media-rich applications across the firm, to communicate and share with one another in our firm and then out to our clients, that is all on our roadmap. We will be taking greater and greater advantage of this.”

– Matt Peers, Global COO, Linklaters



Forty-nine percent of companies highlight the need to ensure they can scale their network.

SDN offers topline benefits.

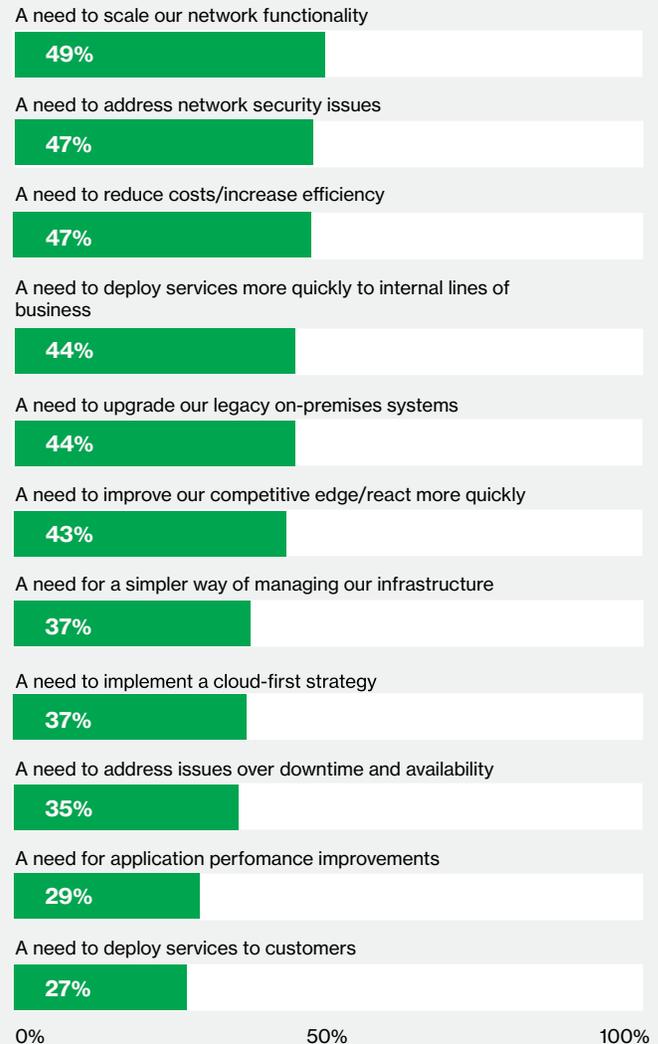


Figure 2. What do you consider to be the main business triggers/catalysts for adoption of SDN? (n = 165)

Improved security is a widely anticipated benefit of adoption.

As they race to capture competitive advantage, many organizations will be wary of leaving themselves vulnerable to security difficulties. Some respondents, however, believe that SDN can improve performance in resilience and security—rather than exposing them to undue additional risk, they argue that SDN delivers the means to tackle their existing vulnerabilities.

In fact, more than half (56%) pick out increased network security as one of the main benefits they are targeting with SDN adoption, and 48% believe improved network performance and resilience will be a benefit. Almost as many (42%) are targeting enterprise-wide networking management.

Lendlease’s Mark Timbs agrees that it would be a mistake to regard cybersecurity concerns as a barrier to adoption.



Over half of respondents (56%) pick out increased network security as one of the main benefits they are targeting with SDN adoption.

“I believe the primary causes of security vulnerability at a networking level are related to human error, which tends to come from complexity. In an SDN world, where you’ve removed some of those layers of complexity and start to converge management into more unified and simple-to-use interfaces, the risk of human error should reduce—that is a significant benefit from a security perspective.”

–Mark Timbs, EMEA CIO, Lendlease

Shaun Baker, Global Director of Network Services at BP, which is also moving toward SDN, argues that it also offers potential advantages in terms of resilience.

“In and of itself, the internet is a pretty resilient thing and we’ve only seen improvements in resilience rather than reductions in our SDN trials.”

–Shaun Baker, Global Director of Network Services, BP

SDN is expected to enhance security, resilience and performance.

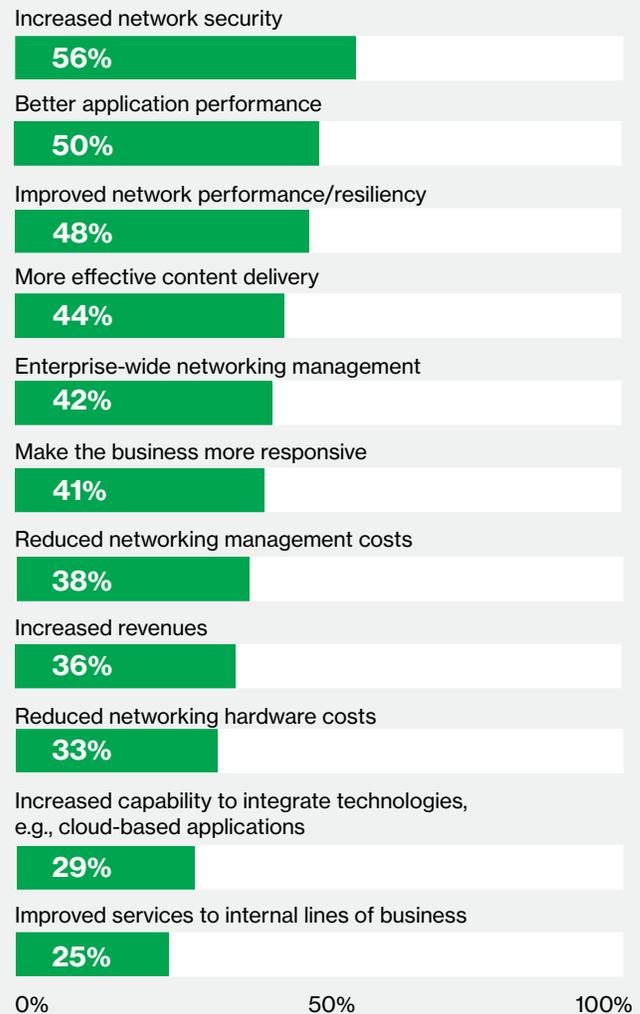


Figure 3. What are the main benefits you are targeting by moving to SDN? (n = 165)

SDN helps deliver better business outcomes.

SDN first movers argue that the tangible business outcomes provide a compelling case for adoption. For example, 86% of respondents agree or strongly agree that SDN can enable more rapid deployment of new applications, services and infrastructure. Some 88% agree or strongly agree that SDN will help them improve services to internal business units, and 81% expect to be able to integrate different connection types under a single management system.

Many of these outcomes resonate clearly with organizations that are now prioritizing innovation as they seek out new sources of growth. Almost 9 in 10 respondents (86%) agree or strongly agree that SDN's greater agility and simplicity will enable them to be more innovative in their approach to new types of applications, services and business models.

Eighty-six percent of respondents agree or strongly agree that SDN can enable more rapid deployment of new applications, services and infrastructure.

Software-driven solutions like network function virtualization (NFV) can also help enterprises get the most out of their networks, by bringing together distant and disparate assets more efficiently.

An interviewee from the financial services sector explains that SDN has the potential to underpin new ventures. At present, when the company is setting up a new start-up—in India, for example—it can take six or seven months to get the proper network connection. SDN will make the process much quicker.

“The need for us to develop at the front end with apps and experiences for our customers impels us to move more quickly. Even when we’re opening physical stores, we’re trying to be much quicker than before – particularly with innovations such as our smaller city and pop-up stores – which means we can’t wait around for someone to get approval to dig up a line for us.”

– Alex Ee, Head of IT Operations and Shared Services, IKEA

Lendlease’s Mark Timbs says that simplicity is a major benefit: “The promise is of a much less onerous environment, without the complexity of having to know which version of the software your various switches and routers are running and how they might conflict. SDN gives you a practical way to manage all of those issues, putting simplicity back into your whole networking layer.”



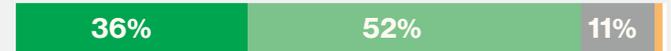
Eighty-six percent of companies say SDN will enable them to design, deploy, manage and scale networks more quickly and easily.

SDN is expected to bring a broad range of business benefits.

SDN will enable us to deploy new applications, services and infrastructure more quickly and easily.



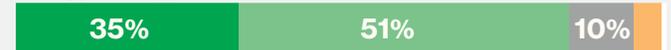
SDN will enable us to improve services to internal business units.



SDN will enable us to integrate different connection types under one management system.



SDN will enable us to be more innovative in our approach to new types of applications, services and business models.



SDN will enhance our mobile networks.



SDN will enable us to design, deploy, manage and scale networks more quickly and easily.



SDN will enable us to offer different types of services.



SDN will enhance our network function virtualization (NFV) capabilities.



Figure 4. To what extent do you agree or disagree with the following statements regarding the business impacts of SDN? (n = 165)

Manage the risk and take advantage of the benefits.

Given the business imperatives of SDN, it's essential that organizations identify, understand and overcome the barriers to adoption. But there's good news: With the right support, adoption is likely to prove less demanding – and the risks less severe – than feared.

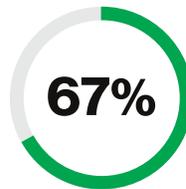
Two-thirds of organizations (67%) say they are concerned about the potential for disruption during the migration process, and 66% cite concern about the complexities of migrating existing networks. These fears are likely to be exacerbated by organizations' concerns about their current levels of SDN skills and experience: 62% fear they lack the right in-house IT skills to handle migration.

Respondents also have concerns about upfront costs. Almost half (47%) cite the need to reduce costs as a driver for SDN adoption and more than a third (38%) pick out reduced networking management costs as a benefit. But two-thirds of enterprises are concerned about the ongoing operational costs of SDN, while 56% worry about implementation costs versus return on investment.

In practice, says BP's Shaun Baker, these are questions to address during the scoping and diligence stage of a potential change exercise, which is useful for building internal support for SDN. "The big part is to get your story nailed," he says. "What's your elevator pitch? What's your vision? How does the work change your financial frame? What skills in your organization do you need to uplift? What are the implications to your sourcing model?"

"Three elements are the most important of all," he says. "First, think about the right vendor for your organization. Next, consider the question of which hardware you will use. Finally, where will you install the central modules? It could be at a vendor's site, and then accessed as a service, or in your own organization, with each software piece integrated. I prefer the first of these options."

"This is really about realigning cost to where value is added," he adds. "Bits moving well from A to B are the table stakes; the value to the enterprise comes in how we can enable agility, and consequently our cost-base should have similar alignment."



Two-thirds of organizations (67%) are concerned about the potential for disruption during the migration process.

There is a range of concerns about SDN adoption.

Disruption and downtime



Complexity of migrating existing networks to SDN



Selecting the most appropriate SDN vendor



In-house IT does not have the right skills to handle migration.



Short-term implementation cost versus ROI



Concern over ongoing operational costs



Investments may be wasted as standards evolve.



Lack of case studies of fully deployed solutions



Understanding of the technology from the leadership team



SDN is not secure enough for critical data.



Figure 5. To what extent do you agree the following attitudes have been or might be a barrier to adopting SDN in your business? (n = 165)

Organizations that have already started to deploy SDN technologies downplay implementation worries. According to one senior IT executive we spoke to, successful SDN deployments will require a step-by-step approach as organizations source third-party support and consider the practicalities.

In practice, the organization might need a mix of services: 34% of respondents believe a combination of global service provider, systems integrator and vendor would be best equipped to help them plan, design and implement SDN. Managing them for effective delivery will require a clear governance model.

Unlock growth opportunities with SDN.

The evidence of this survey suggests significant numbers of organizations are now convinced by the case for SDN. They point to the clear benefits of moving their businesses to a more centralized and automated system of network control, management and development—particularly with the rise of technologies such as cloud and the internet of things.

Moreover, with the direction of travel now clear, the number of organizations seizing the SDN opportunity is set to accelerate rapidly over the next two years. Many organizations have ambitious plans to roll out SDN solutions to every part of their businesses.

This survey also highlights the barriers organizations still see standing in the way of SDN adoption. However, their challenge is to understand adoption risk—and then to mitigate it. The bottom line is that with so many organizations now pursuing SDN adoption—and with the clear value they believe it offers—the greater risk may lie in being left behind.

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