

coevolve™

Your eGuide

# SD-WAN in Multi-Cloud Networking

In collaboration with:

vmware®

 EQUINIX



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# ▲ About this eGuide

The COVID-19 global pandemic has become a catalyst for accelerated digital transformation. As businesses race to adapt to new digital models such as remote working, leaders are now prioritizing digital infrastructure as part of their plans. At Coevolve we spend a lot of time thinking about infrastructure and managed services, and what is required to effectively support enterprises as they transform their networks. One of the major technology trends that we saw from last year has been an increased focus on addressing multi-cloud networking.

This exclusive “SD-WAN in multi-cloud networking” eGuide explores why multi-cloud has become an imperative for enterprises today, how cloud providers are changing the WAN, and the practical application of SD-WAN to solve many of the challenges posed by multi-cloud architectures.

## THE CHALLENGE

Traditional WAN architectures do not work for the multi-cloud model. Current backbone designs lack the flexibility and scalability to handle distributed applications and data-heavy workloads in an efficient and cost-effective manner.

That’s because in multi-cloud environments, more intelligence is required at the edge, to differentiate between what’s critical and what’s not, so that traffic flows can be optimized closer to where they begin. Security also poses a challenge, as backhauling traffic through a central data center is no longer viable for enterprises that need equally high performance and access to data across distributed workforces.

## THE OPPORTUNITY

The changes being driven by multi-cloud are currently impacting enterprise WANs. In the future, enterprise WANs need an integrated security and cloud networking solution that offers flexibility, reliability and scale to move processes quickly off core physical architectures and onto the distributed cloud and that will communicate effectively with several cloud environments with a decrease in the use of dedicated private interconnects.

The solution should also deliver long-term cost savings, simplified connectivity to all business branches, centralized control and management of the entire WAN, and detailed insights into path performance and app usage.

## GETTING STARTED

Going forward, SD-WAN can provide a firm foundation for multi-cloud environments. It is key to first build a business case for SD-WAN—this will help you quantify the benefits of SD-WAN and determine the best path to meeting your objectives. Then, consider the necessary architecture, on both the technical and security fronts; remember to plan for possible future needs such as increased demand and the transition to a zero-trust model of security. On top of that, you will need to select an operational model, which could involve a range of different managed services. Again, it all comes down to your business needs—which option is best for your business?

# Multi-cloud: an introduction

Multi-cloud refers to the use of multiple private, public and hybrid clouds for applications and infrastructure. Its adoption is often not planned, but industry analysts agree that enterprises need to embrace, rather than restrict its use. In many cases, multi-cloud is being adopted due to varying requirements from business units, or compelling cost benefits associated with a specific cloud provider in a region.

## What is multi-cloud?

Multi-cloud is the use of two or more cloud computing services from any number of different cloud vendors. A multi-cloud environment could be all-private, all-public or a combination of both. In today's digital world, companies use multi-cloud environments to distribute computing resources and minimize the risk of downtime and data loss. They can also increase the computing power and storage available to a business.

At present, companies are using 2.2 private and 2.2 public clouds and experimenting with additional private and public cloud platforms, according to the Flexera 2020 State of the Cloud Report<sup>1</sup>. In the near future, as organizations transition to digital infrastructures with hybrid multi-cloud capabilities, Equinix's Global Interconnection Index (GXI) Volume 4 predicts that their connectivity to cloud and IT providers will grow at a compound annual growth rate of 48% from 2019 to 2023.

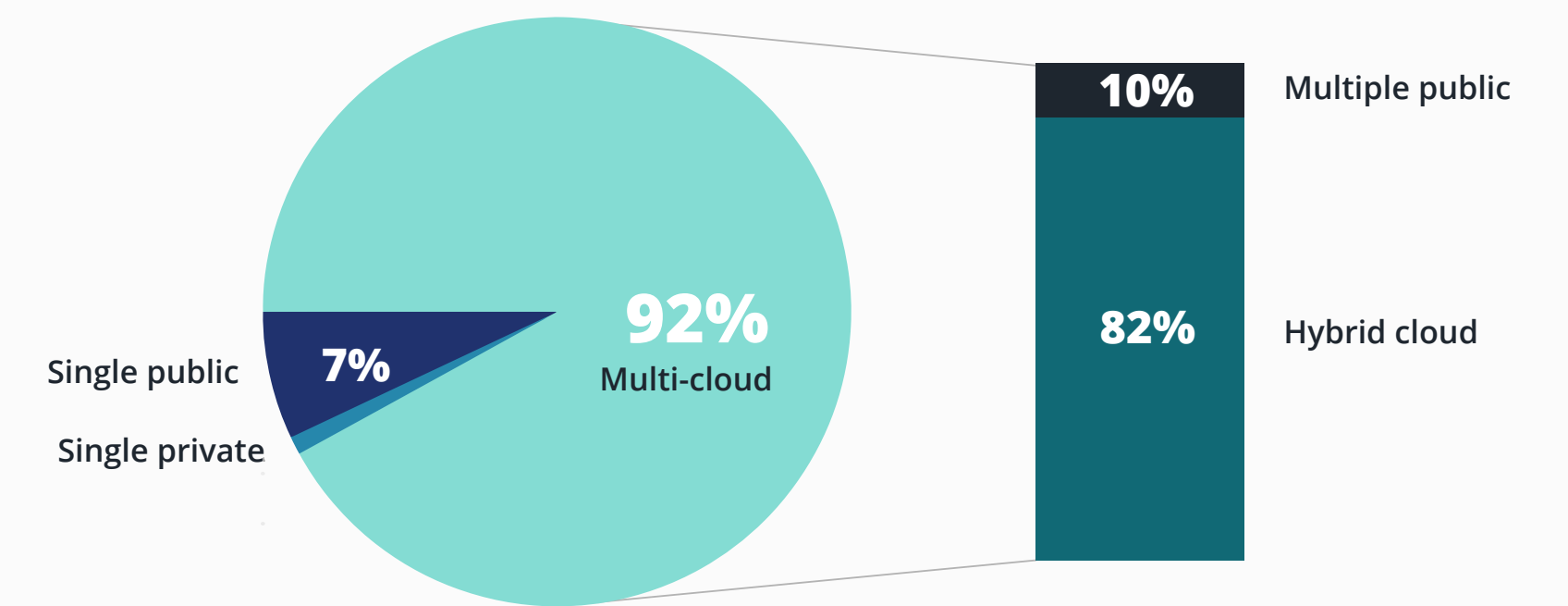
## Why should you consider a multi-cloud strategy?

Cloud has changed the way businesses build, deploy, manage and collect data. This shift means enterprises need to put cloud resources closer to the user to address latency issues and security requirements without compromising end-to-end high performance. Deploying traditional hardware-based data centers is expensive, time-consuming and often proves insufficient in terms of the scope and reach demands of today's digital world. The need for hybrid and/or multi-cloud solutions is evident across global enterprises.

A multi-cloud strategy allows companies to select different cloud services from different providers because some are a better fit for certain tasks than others. The choice of multiple cloud environments gives businesses flexibility, and allows them to reduce the chances of vendor lock-in. Having multiple cloud environments also ensures that a business will always have compute resources and data storage available, to avoid downtime. Finally, multi-cloud can help enterprises achieve their goals for governance, risk management and compliance regulations.

## Enterprise Cloud Strategy

% of enterprise respondents



N=637

Source: Flexera 2021 State of the Cloud Report

Figure 1: According to the Flexera 2021 State of the Cloud Report, 82% of enterprises are taking a hybrid approach, combining the use of both public and private clouds.

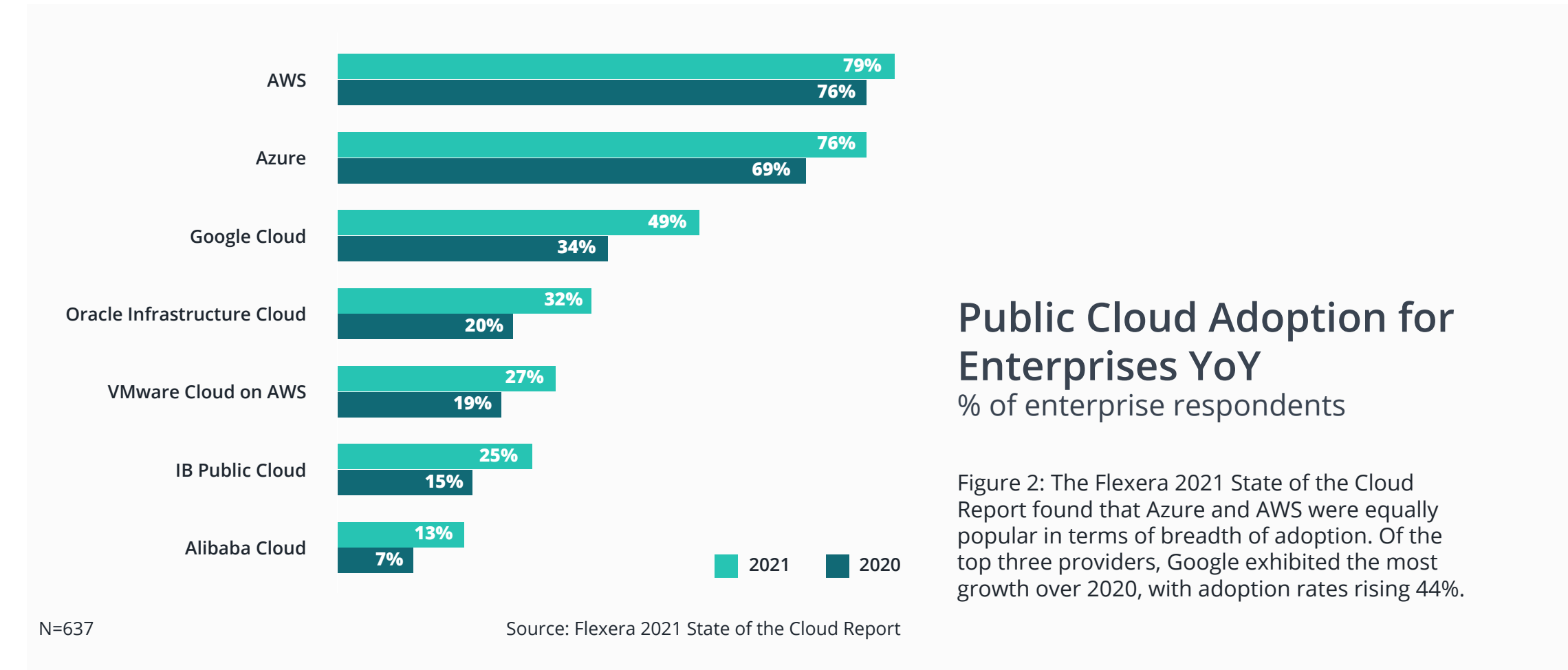
<sup>1</sup> <https://www.flexera.com/about-us/press-center/flexera-releases-2020-state-of-the-cloud-report.html>



## What types of cloud strategies are being adopted?

COVID-19 had a massive impact on digital transformation and cloud adoption in 2020. Released in March 2021, the Flexera 2021 State of the Cloud Report revealed that over 2020, multi-cloud was the strategy of choice for 92% of the enterprises surveyed, and the most common approach was a combination of multiple public and multiple private clouds (see Figure 1)<sup>2</sup>. Enterprises are using various cloud platforms for different applications, or even across a single application, based on the platforms' respective strengths and capabilities to meet their needs. This also gives businesses greater agility and scalability in cloud consumption.

According to Flexera's research, AWS, Azure, Google Cloud, Oracle and VMware Cloud on AWS are the top five public cloud providers, with Google seeing the greatest growth year-on-year over 2020 (see Figure 2). Azure and AWS have similar breadth of adoption among enterprises, but interestingly enterprises also seem to be experimenting more with VMware Cloud on AWS and Oracle, which could mean greater adoption in the future.



**Public Cloud Adoption for Enterprises YoY**  
% of enterprise respondents

Figure 2: The Flexera 2021 State of the Cloud Report found that Azure and AWS were equally popular in terms of breadth of adoption. Of the top three providers, Google exhibited the most growth over 2020, with adoption rates rising 44%.

<sup>2</sup><https://www.flexera.com/about-us/press-center/flexera-releases-2020-state-of-the-cloud-report.html>



Having multiple cloud environments ensures that a business will always have compute resources and data storage available, to avoid downtime.

# ▀ The Challenge

The consistent feedback we hear from enterprises is that the traditional approach for WAN does not work in a multi-cloud environment. With today's fast-changing business landscape and accompanying shift in business requirements, the modern enterprise requires a more secure, flexible, scalable backbone that can efficiently handle distributed applications and data-heavy workloads, often spread across geographies and providers. But what needs to change?

## Evolving business needs require WAN to evolve as well

Modern applications are, by design, created in a more modular style. They can span multiple cloud providers or consume services from multiple clouds. In line with that, the "center of gravity" of the WAN is moving towards cloud providers and away from the internal network. New models that leverage cloud provider backbones to replace inter-region MPLS connectivity are coming to the fore. Automation is now possible, with some options even involving API-based integration with several SD-WAN vendors.

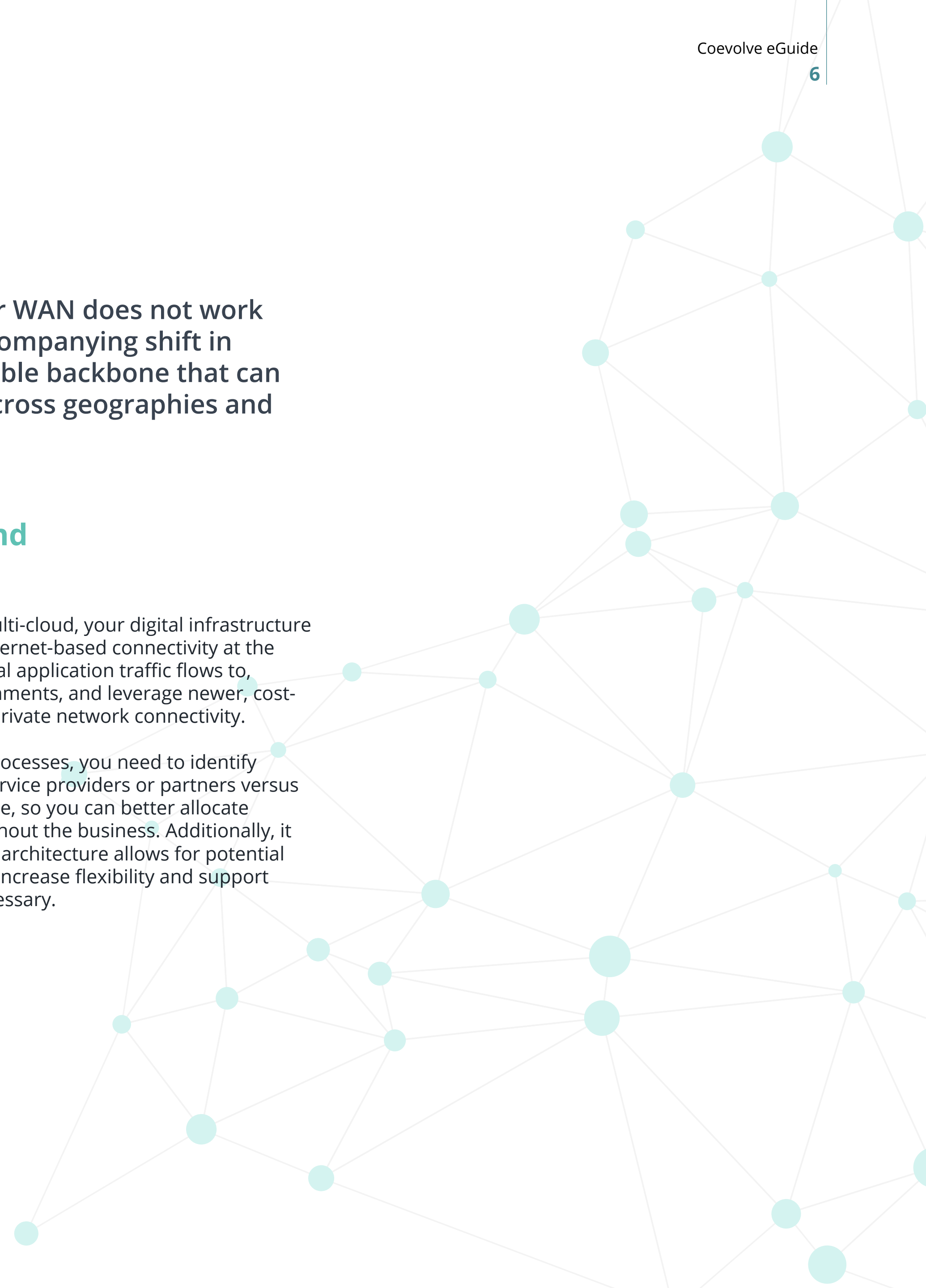
More importantly, moving forward, the WAN must be able to provide the right level of control and filtering for each type of traffic, to better optimize traffic flows. Integrated security has also become a must-have. An emerging "best practices" set of functionality for integrating security and the WAN is called Secure Access Service Edge, or SASE. This allows for the best mix of edge functionality and cloud-scale services to address security as an integral part of the network.

If delivered correctly, multi-cloud can give businesses greater agility and choice in vendors, and can support better operational control by unifying administration and monitoring of the business's IT systems.

## WAN in 2021 and beyond

Ideally, to get the best results from multi-cloud, your digital infrastructure must be able to increase the use of internet-based connectivity at the edge where applicable, prioritize critical application traffic flows to, from and between multi-cloud environments, and leverage newer, cost-effective alternatives for inter-region private network connectivity.

When it comes to your systems and processes, you need to identify functions that can be performed by service providers or partners versus those that must be performed in-house, so you can better allocate resources and foster efficiency throughout the business. Additionally, it may be prudent to ensure your digital architecture allows for potential whitebox deployments at the edge to increase flexibility and support additional service requirements if necessary.





# ▸ The Opportunity

Where does the opportunity lie for enterprise WAN? Coevolve believes that enterprise WAN in the multi-cloud environment must take the following into account:

## | Begin with the underlay

Underlay and overlay both play a role in multi-cloud success. When making decisions, keep in mind:

- Maximize provider choice
- Leverage the best-performing providers at each location on the network
- Optimize for bandwidth—demand will continue to rise in a multi-cloud environment

## | More intelligence needed at the edge

With a variety of cloud destinations, optimizing traffic at the edge is key. Remember:

- Everything looks the same to a traditional router network—HTTPS traffic to external IPs
- Need to be able to differentiate between critical business apps and lower-priority traffic, and steer them appropriately
- Not just transactional traffic—even demanding real-time traffic is moving to the cloud

## | Cloud providers offer new architectures

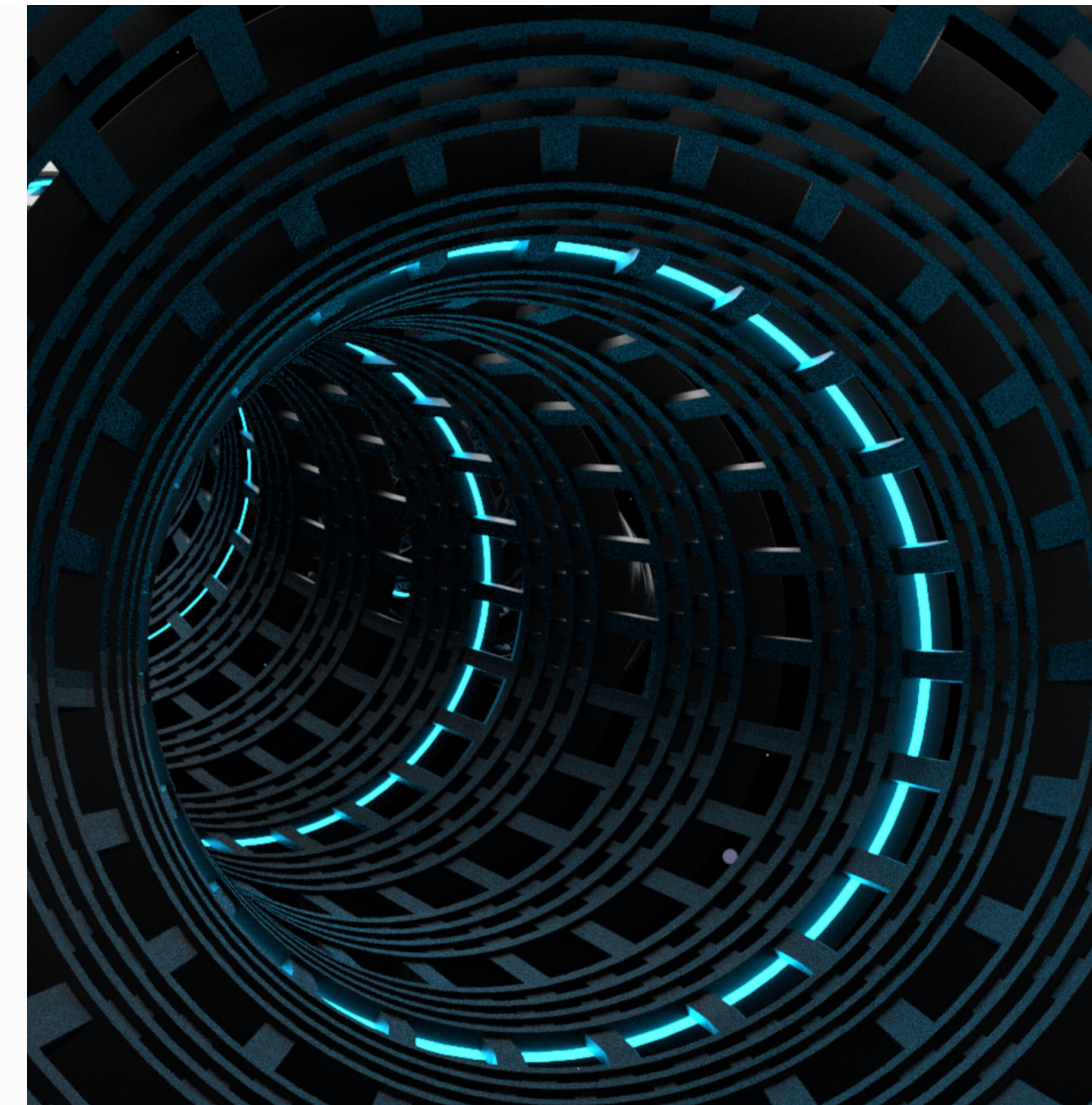
The traditional approach to building backbone networks is simply not suitable in a multi-cloud environment. The market landscape has changed. This means::

- The “center of gravity” of enterprise WANs is moving away from on-premise data centers
- Cloud environments are now an integral part of the environment
- Cloud providers are offering more products to keep traffic on their backbones—Azure Virtual WAN, AWS Transit Gateway, etc

## | Integrated security is essential

Several security trends are contributing to SD-WAN adoption. These include:

- Backhauling traffic is no longer viable when it represents over 80% of the usage of the WAN
- Users expect to be able to operate everywhere with the same functionality—not just in the office environment
- The zero-trust model is gaining traction in the industry





## SD-WAN as the intelligent edge

SD-WAN<sup>3</sup> has a vital role to play in digital transformation. It connects hybrid multi-cloud infrastructures securely, supporting your infrastructure transition to the cloud. But more than that, SD-WAN can make it faster and less expensive to expand your business.

### ✓ SD-WAN offers more benefits

In comparison to hardware-based WAN, SD-WAN lets you:

- Better control the network
- Set network policies and routes at an application level
- Customize and optimize network traffic flow (including through hybrid and multi-cloud environments) to meet business goals, improve performance and scalability and reduce costs
- Provision or configure network services in minutes, easily interconnecting clouds, workloads and other SD-WANs

### ✓ SD-WAN helps save on costs for everyone

In this digital age, few organizations are willing to invest in costly, purpose-built network hardware any longer. Instead:

- SD-WAN allows enterprises, their partners and customers to share virtual network services, removing the expense of hardware network appliances
- Network sharing also aggregates virtual SD-WAN connections, which is more cost-effective

### ✓ SD-WAN can ease your business expansion

A virtualized network can help reduce the growing pains of rapidly expanding organizations with a distributed, remote working model:

- Onboarding and integrating new business partners, branches and remote employees can be very expensive and time-consuming from an IT perspective
- With SD-WAN, you can deploy networking where you need it, when you need it

**“Multi-cloud environments open up many more possibilities for improving performance between regions, and we believe we can play an important role in using this capability to deliver real business benefit.”**

**Ciaran Roche**  
Co-Founder and CTO, Coevolve

<sup>3</sup><https://blog.equinix.com/blog/2021/05/28/scaling-your-business-the-easy-way-with-sd-wan-as-a-service/>



# Getting started

Multi-cloud environments require a more sophisticated edge, and SD-WAN can provide a foundation for this. So where and how do you start?



## Step 1: Build the business case

Our methodology lets you build a base to compare traditional WAN solutions with the opportunity available through a network transformation approach embracing technologies such as SD-WAN. The methodology involves:

- Cost Category 1—Direct Operating Costs
- Cost Category 2—Sustaining Operating Costs
- Cost Category 3—All in Costs
- Building the TCO comparison



## Step 2: Consider the technical architecture

To maximize the benefits of SD-WAN, focus on the integration between the overlay and the existing WAN. Some technical considerations may include:

- Less focus on primary/backup circuits, more on a pool of connectivity
- Look at high availability options for resilient sites
- Leave forwarding decisions to the SD-WAN whenever possible
- Carefully consider routing protocol integration



## Step 3: Security integration

With SD-WAN, enterprises can use techniques like Network Function Virtualization (NFV) and service chaining in the WAN, allowing:

- Services that would traditionally have been deployed as appliances to be implemented as a virtualized service (e.g. firewalls)
- The deployment of generic VM host hardware at their sites, with SD-WAN, firewalls, and other functions becoming VNFs on this hardware

Reducing the number of appliances is seen by many enterprises as a positive step, as it allows for a reduction in hardware maintenance costs and potential failure points.

Coevolve's Integrated SD-WAN Solution incorporates Service Chaining and NFV to integrate next-generation security solutions with the WAN.



## Step 4: Decide on the operational model

Your operational model will likely include managed services, but the degree of management and type of services may vary, depending on your needs. Some options include:

- Co-management model
- API-based integrated reporting

In the latter case, Coevolve's Professional Services team can build customized reports and dashboards for you, in some cases combining data from multiple APIs to provide a consolidated view of the network.

# How we can help

Coevolve has recently partnered with Equinix to serve customers and accelerate digital transformation, offering our integrated SD-WAN, security and cloud networking solutions on Equinix's Network Edge. Through Network Edge and Equinix Fabric, our customers can deploy their digital-ready infrastructure anywhere in minutes.

With organizations accelerating digital transformation initiatives in the wake of COVID-19, many are migrating from physical infrastructure and embracing hybrid multi-cloud models and services to meet their objectives. This, combined with more dispersed employees and customers in different geographic locations, means networks must be agile, flexible and easier to deploy and manage.

By delivering its next-generation SD-WAN, security and cloud networking solutions on Network Edge, Coevolve can enable its customers to manage their own end-to-end peering relationships with the cloud service providers of their choice via Equinix Fabric. This is said to enhance application performance for remote users within minutes and without any upfront capital expenses.

## Modernize your network virtually

As demand for network capacity increases, businesses are forced to quickly deploy and scale their networks to support new services and applications, while maintaining superior user experience. To meet this challenge, Equinix created Network Edge, a network automation tool enabling you to select the virtual network services you want, deploy virtually in the locations you need and connect instantly to the destinations you require.

### ✔ Support expansion strategies

Build virtual infrastructure at scale to match opportunity in growth markets.

### ✔ Improve performance

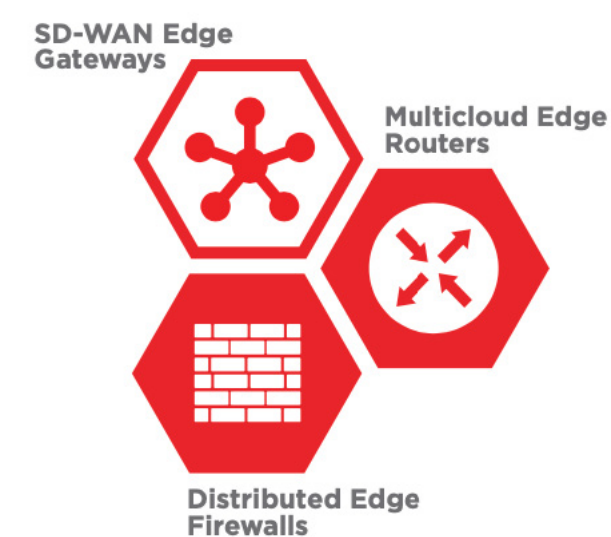
Distribute and deploy low-latency network infrastructure closer to end users.

### ✔ Achieve faster time to market

Available in minutes vs. months through automated network configurations.

### ✔ Access digital ecosystems

Including clouds, networks and digital supply chains.



## About Coevolve

Coevolve is a leading global provider of telco-independent software-defined WAN (SD-WAN), Secure Access Service Edge (SASE) and multi-cloud networking solutions to enterprises, with 100% focus on delivering an outstanding client experience. Coevolve was established in 2014 to drive enterprise adoption of next-generation networking technologies such as SD-WAN. Coevolve currently provides services to global enterprises in more than 80 countries on six continents.

Learn more at [Coevolve.com](https://Coevolve.com)



## About VMware

VMware SD-WAN simplifies branch WAN networking by automating deployment and improving performance over private, broadband Internet and LTE links for today's increasingly distributed enterprises, as well as service providers. VMware SD-WAN goes beyond the basics to offer a true, complete SASE solution that supports enterprises' shift to the cloud.

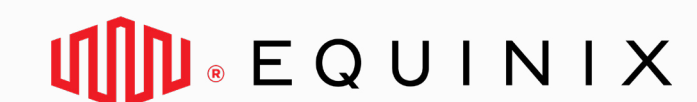
Learn more at [VMware.com](https://VMware.com)



## About Equinix

Equinix, Inc. (Nasdaq: EQIX) connects the world's leading businesses to their customers, employees and partners inside the most interconnected data centers. In 65 markets across five continents, Equinix is where companies come together to realize new opportunities and accelerate their business, IT and cloud strategies.

Learn more at [Equinix.com](https://Equinix.com)





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