

A SIMPLE GUIDE TO CLOUD CONNECTIVITY

and how to avoid it being a major
stumbling block in your IT strategy



INTRODUCTION

This guide is intended to provide an overview of cloud connectivity for enterprises and managed service providers. It highlights the issues that arise with different types of connections and the benefits of connecting to cloud service providers (CSP) via dedicated connection solutions such as Epsilon’s Cloud Connect.

Cloud computing provides a blueprint for how enterprises and connected devices can evolve. Although cloud adoption sits at the helm of digital transformation, some enterprises have been reluctant to make the move, with cybersecurity concerns emerging as the largest block to its adoption.

But now, over 60% of security professionals believe the risk of a breach is the same, or lower, in public cloud environments compared to on-premise.

Changing attitudes demonstrate a cultural shift within the IT community and in fact, the cloud is already mainstream.

94%

of enterprises already use a cloud service¹

By 2020, **83%** of enterprise workloads² will be on the cloud



\$623.3 billion global market³ by 2023

¹ Cloud Computing Trends: 2019 State of the Cloud Survey: <https://www.flexera.com/blog/cloud/2019/02/cloud-computing-trends-2019-state-of-the-cloud-survey/>

² 83% Of Enterprise Workloads Will Be In The Cloud By 2020: <https://www.forbes.com/sites/louiscolombus/2018/01/07/83-of-enterprise-workloads-will-be-in-the-cloud-by-2020/#7014b52a6261>

³ Cloud Computing Market worth \$623.3 billion by 2023: <https://www.marketsandmarkets.com/PressReleases/cloud-computing-market.asp>

What is the public cloud to the modern enterprise?

Cloud computing has become ubiquitous and widely accessible to businesses via public internet connections. And the payoff for enterprise? Faster-paced business, more flexible working, increased productivity, and lower operational costs overall.

Those who already use cloud services, and are familiar with the benefits, will fully understand how this has revolutionised modern business.

An increasing appetite for cloud applications has driven the rapid maturity of the market, which is hardly surprising when you review what cloud services mean for the modern enterprise. It allows them to be what they need to be in modern times – agile, flexible, cost efficient and infinitely scalable.

BENEFITS DRIVING CLOUD ADOPTION



Infinite scalability



Flexible pricing options based on different SLA offerings



Faster deployment, without large investment



Cloud environment maintained by CSPs



Only pay for the services and resources you use

CHALLENGES OF CONNECTING TO THE CLOUD

Service outages, poor performance and security risks are some of the most common cloud pitfalls today.



CHALLENGES OF CONNECTING TO THE CLOUD

As cloud computing matures, the demands for instant access to everything, everywhere, on any device, continues to ramp up. Businesses can no longer ignore network infrastructure that underpins the delivery of their critical apps, cloud services and IT strategies.



But whose fault is it?

CSPs and Software-as-a-Service (SaaS) companies are often blamed for service outages but, in reality, have limited control over a reduced quality in their services owing to poor connectivity.

But enterprises rely heavily on the public cloud and its applications, especially as hybrid IT strategies become commonplace. As a result, businesses must combat connectivity problems by investing in network connectivity strategically.

Removing the weak link at the network layer

The network is largely ignored when migrating to a cloud environment, with businesses instead focusing on cost and scalability. But they soon realise connections are not robust and secure enough to support next-generation workloads and apps.

As a result, enterprises are confronted with latency and response time issues. This is not solely their fault; network operators are also failing to consider this when selling connectivity to enterprises, making the public internet the final remaining weak link in the layers of service delivery.



Traditional networking models are really not designed to support and fuel the growth of cloud. The cloud is all about scale, agility, ease of access and on-demand. Today, we need to build network and connectivity services designed to support the growth of cloud services."

CONNECTING TO THE PUBLIC CLOUD

There are several different ways to connect to the public cloud, public internet just being one of them. In this section we will discuss your options and key considerations for your cloud strategy.



CONNECTING TO THE PUBLIC CLOUD

The Public Internet

The easiest, but not always the best.

Connections over the public internet are easy to set up. Connect via your corporate network and you are ready to go. However, those in network architecture know that the public internet is a crucial, and often overlooked, weak link in the delivery of cloud services.

It is easy to connect to the cloud...isn't it?

A myth amongst enterprises is that it is easy to connect to and deploy cloud environments. But for many organisations, once they start building out cloud environments, they realise they need to connect back to on-premises infrastructure and for these two worlds to regularly exchange data - as with a typical hybrid environment.

New challenges for IT infrastructure leaders

Increased public cloud adoption has also led to IT challenges in uncharted territories. IT departments are expected to do more as internal demands for cloud use accelerates, far past familiarity. Network infrastructure leaders are being forced to address the

emerging technical skills gap, alter processes and break down silos to deal with the challenges of cloud connectivity.

For enterprises working with sensitive or mission-critical data and those that want high visibility or control over their infrastructure, the public internet creates a number of major vulnerabilities. Let's look at why this is the case a little closer.

Public internet routes are dynamic and shared, which can lead to congestion. This means when the most direct link is not available, data packets are routed through the next best option, which you have no control over. Generally, having a backup is positive, but when routes are disrupted and the network is congested, the public internet is not reliable. This often results in packet loss and increased latency.

Cyber attacks are on the rise and the public internet is where they occur. If you are relying on the public internet, you are vulnerable to cyber attacks such as Distributed Denial-of-Service (DDoS). These sorts of malicious attacks are reported globally, regularly, and are on the rise. They can create serious issues for businesses in today's



digital world, leading to congestion and packet loss for all traffic traversing infected routers and links – resulting in significant costs to your business.

Multiple handoffs of packets between internet service providers (ISPs) creates instability in the connection and an increased threat risk. Each time your data passes through a router, it is processed and sent along to the next device. Multi-hop packet transfer, which are common, means that several routers are involved in delivering your data to its final destination thus more points of failure and attack.



Key vulnerabilities to your enterprise

- Repeated passing and processing of data takes time, and because more and more hops are taking place, your delivery speeds slow down.
- Bad actors, Botnets and DDoS attacks are on the rise, and can create serious issues for businesses.
- This negatively impacts your customers' experience and resources.
- Multi-hops also mean more points of failure and a wider surface area for attack, resulting in potentially catastrophic loss of data or downtime.
- Any downtime can lead to massive losses commercially, [estimated at \\$5,600 per minute by Gartner](#), as well as untold damage to the reputation of your business.

Technology Trend to Watch

Some network service providers are looking at Resource Public Key Infrastructure (RPKI) to secure the public internet, which introduces an additional layer of authentication via a trust anchor, but this is yet to be widely adopted by enterprise and it remains to be seen how it mitigates poor performance issues with the public internet.

Virtual Private Network (VPN)

A more robust path across the public internet

A VPN allows you to quickly create a private network over a more open network, and cost little more than the hosting compute power and total bandwidth transferred. However, VPN connections to CSPs are still delivered at Layer 3 via a service provider across the public internet, meaning many of the same problems remain. This includes performance issues from inefficient routing, network attacks and congested connections.

Fragmented data packets

Due to the way servers transfer data via a VPN, packets are often large and have to be broken down before being forwarded on. This fragmentation and reassembly may cause CPU and bandwidth overhead, which slows down the overall performance.

Key reasons VPN is not so great

- Inconsistent connection speed and availability
- Limited long-term sustainability
- Public internet connectivity, meaning performance issues remain
- Reliant on your ISP to route traffic correctly
- Prone to MTU fragmentation of packets and reassembly, impacting overall performance

Dedicated, Direct Cloud Connections

The fastest, safest route to and from your cloud environments. The rise of the “direct connect”

Instead of relying on the public internet or VPN tunnels, enterprises should consider using internet-bypass solutions. CSPs such as Amazon Web Services (AWS), Microsoft Azure, Alibaba Cloud and Google Cloud Platform have created partner programs and teamed up with network service providers and connectivity innovators to enhance cloud connectivity and automation capabilities. Some well-known examples include: AWS Direct Connect, Microsoft Azure ExpressRoute, Alibaba Express Connect and Google Cloud Interconnect.

This enables you to connect directly to the public cloud of your choice, rendering the performance, quality of service and security problems of the public internet obsolete. Cloud services and cloud networking regions for each provider, can be connected to directly via ‘on-ramps’ at data centres where the CSP is present across the world.



We are changing what is possible in networking, enabling the cloud to deliver the connectivity services of the future. Businesses are now expecting their cloud connectivity to be on-demand, globally scalable, data-driven and guaranteed quality.”

Cloud on-ramps and internet-bypass global connectivity solutions

If you are present in a data centre with public cloud on-ramp, you can connect to popular cloud services with a simple data centre interconnection (also known as cross-connect). This connects your equipment to the CSP via Layer 2 Ethernet with speeds from 50Mbps up to 10Gbps.

If you are not present at a data centre with cloud on-ramps, then global connectivity providers such as Epsilon can provide you with the backhaul connectivity you require to directly connect your premises or alternative facilities to the public cloud(s). This can be delivered via a Network as a Service (NaaS) model or last-mile delivery solutions.

However, for those without on-ramp cloud services, Epsilon can remove the complexity of connecting directly to a CSP, which requires self-configuration and will become quickly unmanageable at scale – especially without inhouse skills.

NaaS is changing the game

With NaaS platforms, such as Infiny by Epsilon, the combination of advanced tools and cloud ecosystems now alleviate the need for up-front investment in networking infrastructure and begin to close the skill gaps that IT

infrastructure leaders are challenged with. The differentiator with NaaS is in automating these direct cloud connections, reducing time spent on provisioning and the need for additional manpower and resources.

Without such evolved cloud networking platforms, enterprises would be burdened with finding a carrier, managing their own network and configuring interconnection services themselves. For multi-cloud strategy, this becomes very complex, as connecting to multiple clouds or between clouds brings together a whole host of new challenges, requirements and knowledge.

Real world case for internet-bypass

As the [major Cloudflare outage in June 2019](#) highlighted, the internet is fragile. This was an internet disaster because of a route leak that impacted services across Google, WhatsApp, Verizon, China Telecom, Nintendo Life and even AWS. Many hundreds and thousands of businesses still rely on the public internet to carry mission-critical data and run digital services, often without understanding the real risk this poses to their business. By establishing a direct link to your CSPs, you can ensure your sensitive data is transferred correctly between your facilities and the public cloud, with a drastically reduced chance of downtime or interference.

CLOUD ON - RAMPS LOCATIONS



Alibaba Cloud



Amazon Web Services



Microsoft Azure



Google Cloud Platform



IBM Cloud



Oracle Cloud

Reduce your data transfer costs

Direct cloud connections can also save you money. By buying your own dedicated connections to CSPs, you could avoid significant data transfer fees, depending on the amount of data you transport in (egress) and out (ingress) of your cloud environment and the number of clouds you manage.

Take the pricing example from the [AWS Data Transfer Out On-demand Pricing](#) and compare to [AWS Direct Connect charges](#). Breaking down the costs of on-demand direct connectivity services from providers like Epsilon, plus direct connect charges applied by your CSP, you will be able to compare this against your data transfer fees with each CSP.

Reasons to choose direct cloud connectivity



Dedicated interconnection that bypasses the public internet and its hazards



Connections are more stable, predictable and have lower latency



Direct route removes multi-hops and associated security concerns



No need to invest in your own global infrastructure or understand how to configure BGP

Gartner
estimates
that a single
minute of
downtime
costs an
average of
\$5,600

CLOUD CONNECT BY EPSILON

A flexible and secure internet-bypass solution for optimising your business applications and cloud services.



CLOUD CONNECT BY EPSILON

Scalable, private and secure direct connectivity to an ecosystem of world-leading CSPs.

Epsilon's Cloud Connect solution connects enterprises with the world's largest CSPs via on-demand, dedicated and private connectivity.

Cloud Connect via Infiny — An Award-Winning NaaS Platform

Cloud Connect works through Epsilon's award-winning NaaS platform, Infiny. Infiny is an orchestrated virtualised networking platform that connects you to the public clouds in a convenient and cost-effective way, without compromising security or reliability. Cloud connections can be provisioned in minutes with complete visibility via Infiny.

It leverages Epsilon's MEF-certified Ethernet service, which delivers granular bandwidth ranging from 2Mbps up to 100Gbps. With Infiny, the Cloud Connect solution allows you to turn up a network service anywhere on Epsilon's network fabric and connect to multiple CSPs around the world.



Key Features



Network Visibility

Real-time analytics on the performance of your networking connection, latency, jitter and packet loss.



Secure Data

Protect your mission-critical data over Epsilon's MEF-certified carrier-grade global private network.



Extensive Reach

Over 220 Points of Presence (PoP) worldwide means you can rely on Epsilon to connect you whenever you are, to wherever you need to reach.



Dedicated Experts

A dedicated team of experts keep your critical operations running 24/7. Understanding the ICT and CSPs requirements.



Scalable Model

Scale your network infrastructure up and down with an on-demand connectivity model, removing the complexity when connecting to CSPs across multiple geographies.



Dense Cloud Ecosystem

Connect to the world's largest cloud platforms including Alibaba Cloud, AWS, Google Cloud, Microsoft Azure and Oracle Cloud without the need for multiple contracts.

CASE STUDY

Asian Enterprise Accelerates Digital Transformation with Cloud Connect to Microsoft Azure

The Challenge

An Asian multinational investment holding conglomerate, with multiple business units across Singapore, needed remote access to their cloud-based enterprise resource planning (ERP) system. The organisation had already deployed its ERP system in its Hong Kong office using a direct connection to Microsoft Azure.

It had achieved great results and wanted to roll out a similar architecture in their business in other countries. The conglomerate owns and operates businesses across five continents and is involved in several markets including property, hospitality, logistics, media, maritime, commodities, environment and philanthropy.

Their objective was to lower long-term cost and accelerate the efficiency with a private connection for secure and reliable accessibility. They had previously struggled to find scalable and cost-efficient direct access to Microsoft Azure and were particularly concerned with the complexity of managing multiple cloud connections.

Epsilon's Solution

- Cost-efficient cloud access with the [Cloud Connect solution](#).
- Delivered two ExpressRoute circuits to Microsoft Azure from Epsilon's PoP located at Equinix SG1 and Global Switch Tai Seng in Singapore.
- The diverse routes strengthened resiliency and ensured high availability of the cloud connections.
- With Infiny, the enterprise gained a simple way to procure, deploy and manage their cloud connections. This also allowed it to establish direct connection to multiple CSPs in the future.

The Results

- A flexible and secure internet-bypass solution to the enterprise to directly connect them to Microsoft Azure through Epsilon's MEF-certified Ethernet service.
- An end-to-end cloud connectivity solution that supported the business in deploying its ERP workload on Microsoft Azure with no disruption to their operations.
- The enterprise is now able to securely access its cloud-based ERP system with a cost-efficient connectivity model.



THE BEST ROUTE TO THE CLOUD

The key to reliable connectivity and great quality of service is by aligning your IT infrastructure with day-to-day workload demands which today, will no doubt involve the cloud. Whether you opt for a public, private, multi-cloud or hybrid environment, direct connection to the cloud is clear for enterprises looking to resolve public internet woes, to gain a competitive edge and prepare for a next-generation world.

Contact us to discuss your cloud transformation

Europe: +44 207 096 9600 | Asia: +65 6813 4020 | Middle East: +971 4 444 9570 | USA: +1 516 888 7818

epsilontel.com • info@epsilontel.com