Partner with Equinix for faster cloud access

Transfer data more efficiently and improve network wait times by moving strategic parts of your IT infrastructure to an Equinix data center

Due to the increasing volume of cloud traffic, the network connection between you and your cloud partners is more important than ever. And no matter how good your hybrid cloud infrastructure is, the time it takes to process requests and the number of requests you can handle at once depend on how efficiently the network connection can transfer information.

As your company works hard to keep ahead of both demand and the competition, long network wait times can kill any forward momentum your business is making. Consider re-evaluating your approach to hybrid-cloud applications and look closely at interconnection at the cloud edge. It's time to think outside your on-premises data center.

Principled Technologies engineering staff set up a hybrid-cloud infrastructure running a distributed e-commerce application with the back-end database server residing on a technology stack consisting of privately owned resources. These resources included virtualized compute, storage, and networking components connected to order-entry clients residing in a public cloud. Next, we compared application (order-entry) response times and file transfer speeds in three hybrid-cloud connectivity scenarios to see how much of a difference it can make to bypass a shared public internet connection and switch to a secure, dedicated, high-speed network connection between you and your cloud partners.

Increase order processing potential by up to **48%***

Decrease application wait times by up to **41%***

Reduce network-related wait times by up to **96%***

We found that the hybrid IT architecture, with private infrastructure components hosted in an Equinix International Business Exchange™ (IBX®) data center interconnected to a cloud service provider, dramatically increased application processing, thus providing faster interactions with the web application while decreasing network wait times and data transfer times.

compared to a shared public connection

Principled isn't just a word; it's our philosophy. We are a transparent and independent third party you can trust. Our fact-based marketing collateral tells the truth about what we found and shows our hands-on work through detailed methodologies.[1]

Keeping everything on premises

For the first two hybrid-cloud connectivity scenarios, our engineers set up a web application that leveraged a public cloud for distributed order-entry traffic-source client systems. This application housed its data in an on-premises database server backed by enterprise block storage within our data center in Durham, NC, while the cloud service provider housed the order-entry traffic production clients. We protected this data by placing our database server behind a load balancer, which allowed us to limit the types of traffic that could access our server.

Scenario 1 configuration: ISP shared public connection

The first testing scenario involved data stored at our local site. The clients that accessed this data via web application were hosted in a public cloud and connected to the public internet through an internet service provider (ISP). Processing orders and transferring large files on this public internet fiber connection meant our prioritized workflows traveled with everything else on the public internet, so we could not know which route or detours the information took before reaching its destination.

ISP shared public connection diagram

PT facility–Durham, NC

TOR management switch

Load balancer

Server

Fibre Channel storage switch

Enterprise block storage

Public (ISP)

Public cloud

US East (N. Virginia)
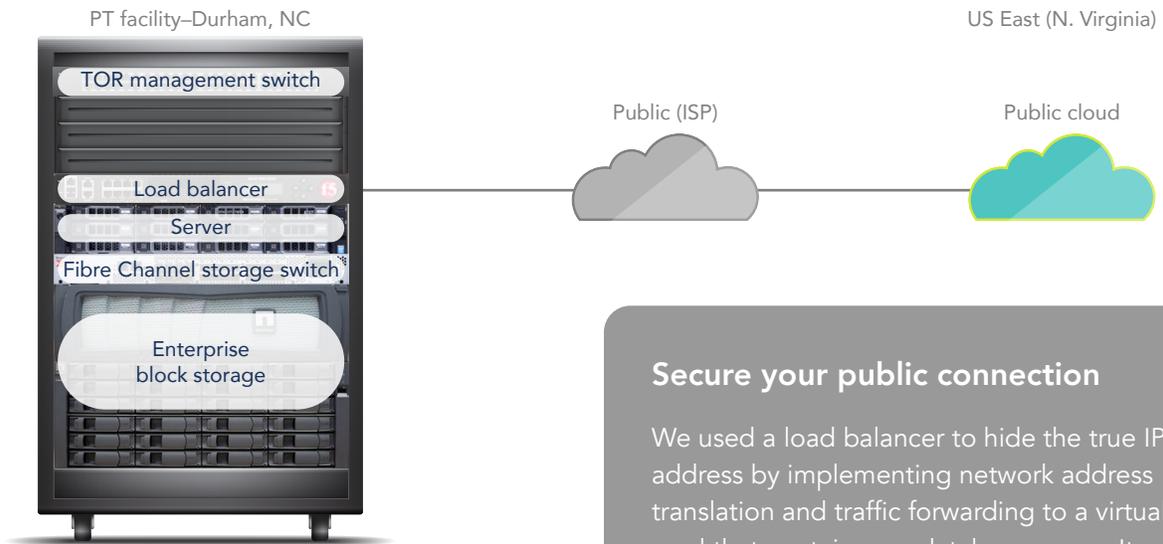
Secure your public connection

We used a load balancer to hide the true IP address by implementing network address translation and traffic forwarding to a virtual pool that contains our database server. It prevents the server from direct exposure to incoming internet traffic, and allows you to forward only the traffic coming in on the TCP ports you define within the forwarding rules.

Scenario 2 configuration: NSP to Equinix to a cloud service provider network

We kept our database server, private virtualized compute, storage, and load balancer on premises for the second testing scenario, but switched to a network service provider (NSP) with a private, dedicated fiber Ethernet connection to Equinix and the cloud service provider network. We also used the load balancer to establish a cloud-required Border Gateway Protocol (BGP) session so we could route packets from the cloud service provider network to the private network at Principled Technologies over our dedicated private connection. This allowed us to split our prioritized workload traffic apart from our public, everyday business traffic. So, activities that involved employees streaming media, clients or coworkers uploading or downloading large files, and normal business usage didn't affect our scenario response times because we bypassed the crowded public internet connection.

NSP private connection diagram

PT facility–Durham, NC

TOR management switch

Load balancer

Server

Fibre Channel storage switch

Enterprise block storage

Private (NSP)

Equinix campus–Ashburn, VA

NSP point of presence

Equinix cross connects

Cloud service provider network edge presence

Equinix IBX data center

US East (N. Virginia)
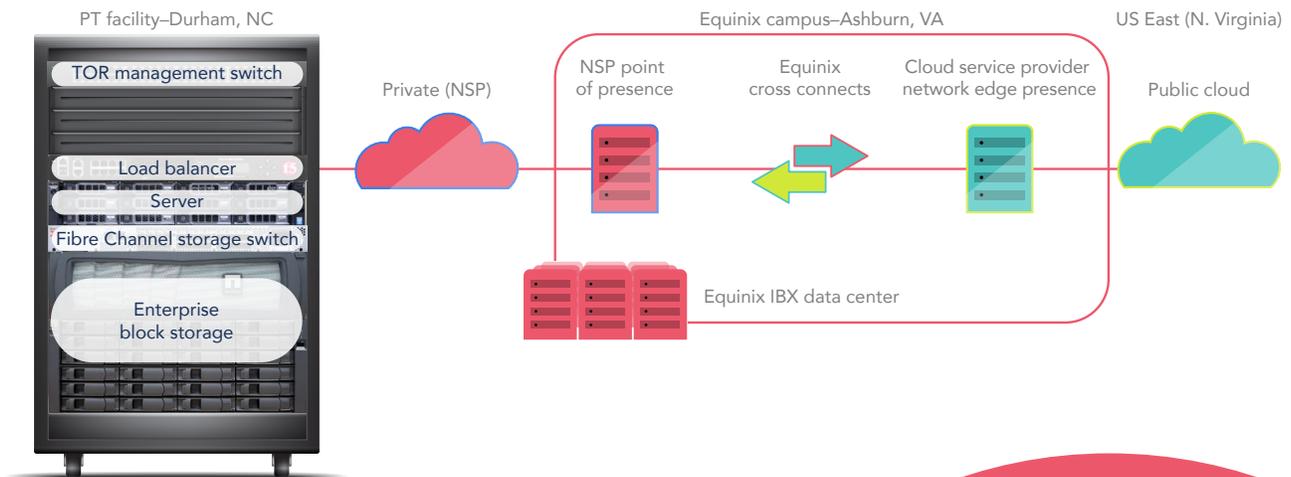
Public cloud

Private access to the public cloud

Equinix offers multiple connectivity options to public cloud providers, including cross connects and Equinix Cloud Exchange Fabric™ (ECX Fabric™), giving users the ability to choose the option that best suits their specific ecosystem.[2]

Optimize performance

The Equinix Solution Validation Center™ (SVC™) provides a sandbox where you can safely progress from testing to analysis to implementation and production. SVC also has technology experts and Global Solutions Architects™ who can help your company make technology decisions that suit your specific business. In our case, they helped us test our connections and made sure everything worked.[3]

Think outside your on-premises data center

Your company devotes a lot of time and money to building and maintaining an IT infrastructure that provides the compute power needed for your mission-critical apps. But all that effort is wasted if your data is traveling on the same crowded public cloud highway as everyone else in the world. Your Ferrari isn't going to get you to your destination any faster than the public bus stuck next to you. While a private lane may be faster because it's not congested, it's still far away from the cloud edge. In fact, keeping your data center in house can put you at a distinct disadvantage when time is of the essence.

Scenario 3 configuration: Equinix to an interconnected cloud service provider network

In our third testing scenario, we moved the private components of our hybrid cloud infrastructure to an Equinix IBX data center, interconnecting the infrastructure with a cloud service provider private connection within the colocation facility (a data center where cloud partners run their own infrastructure in close proximity to one another). We used the load balancer to establish both the BGP session to the cloud service provider and as an intermediary device that connected us to our remote stack via our dedicated connection. Our engineers found that establishing this hybrid cloud deployment at Equinix offered a more stable, predictable, lower-latency, and higher-throughput option for connection to the cloud than the public ISP configuration, with better transactional database performance than both the ISP and dedicated NSP connections we tested.

Hybrid cloud deployment at Equinix diagram

Equinix campus–Ashburn, VA

US East (N. Virginia)

TOR management switch

Load balancer
Server
Fibre Channel storage switch

Enterprise block storage

Equinix cross connects

Cloud service provider network edge presence

Public cloud

PT facility Durham, NC

Equinix IBX data center
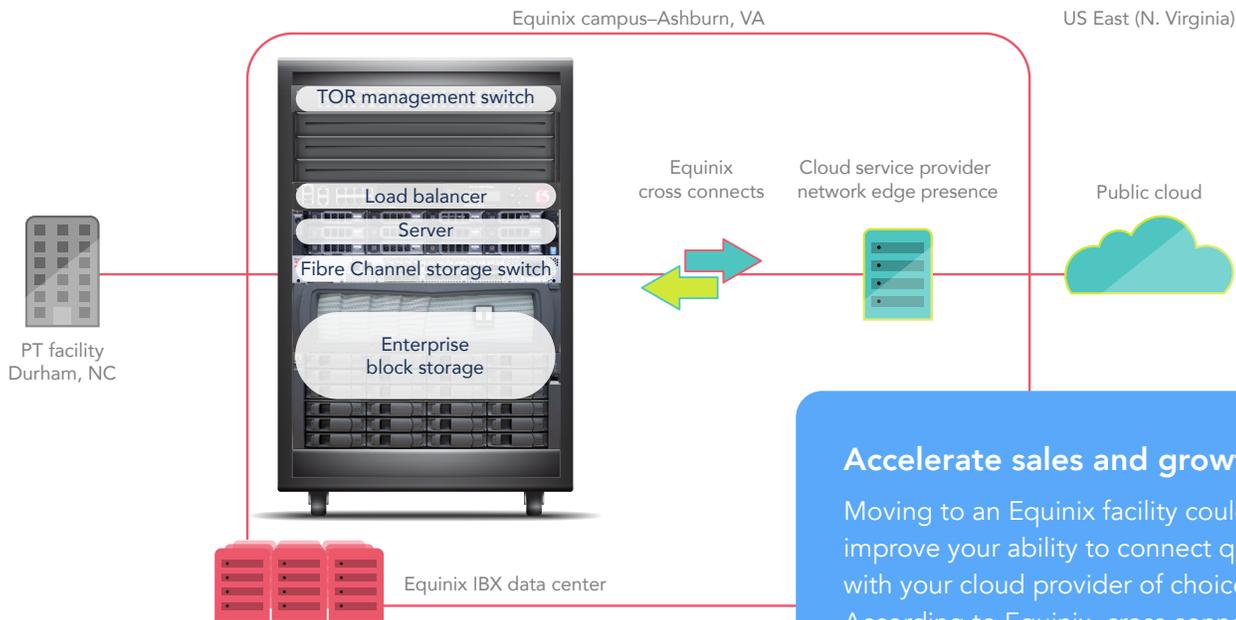
Accelerate sales and growth

Moving to an Equinix facility could improve your ability to connect quickly with your cloud provider of choice. According to Equinix, cross connects are direct, secure, physical connections at an Equinix IBX data center that "provide enhanced network performance, increased resiliency, more reliability and added security."[5]

Extend your data center to the digital edge

Equinix defines the digital edge as the space "where people and things connect to the network."[4] With your production gear colocated at Equinix, your hardware is close to the data source. Leveraging private, direct interconnection within Equinix between your colocated infrastructure and service providers can provide replication, failover, and backup capabilities.

## Improve network performance, reliability, and security

According to Equinix, establishing a hybrid cloud deployment at Equinix "gives you the ability to efficiently deploy resources at the edge, closest to your end users, enabling a whole new level of global network performance."[6]

Handle more business

How does the network connection you're using affect the speed of business? We compared order-entry response times to see. Our test results show that conducting business over a private, high-bandwidth fiber connection in an Equinix IBX data center increased our order processing potential by up to 48 percent. We found that moving strategic compute, networking, database, and storage components to Equinix increased the number of requests we could handle at once and provided faster interactions. This allowed us to maintain control over our hardware and reap the benefits of having strategic parts of our IT infrastructure in an Equinix IBX data center with direct interconnection to our cloud service provider network.

Increase order processing potential

Total orders per minute *(orders)*

47,648	
45,141	
70,859	up to **48**% MORE

(higher is better)

Reduce application wait times

Average application latency *(ms)*
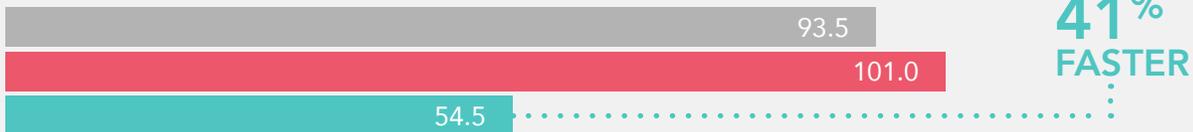
93.5	
101.0	
54.5	up to **41**% FASTER

(lower is better)

- ⬛ ISP shared public connection
- 🟥 NSP to Equinix to cloud service provider network
- 🟩 Equinix to interconnected cloud service provider network

Transfer data efficiently

How does your network connection affect the flow of information? We uploaded and downloaded 5GB high-definition (HD) video files to see. Our test results show that the public 1Gb fiber internet connection was slower, possibly due to inefficient routing or network congestion and resultant TCP windowing, which negatively affects file transfer times. Conversely, transferring data over a private, dedicated, 1Gb high-bandwidth fiber connection allows for larger data packets and faster transfers, which could account for the dramatically reduced file transfer times.

What is TCP windowing?

Transmission control protocol (TCP) windowing dynamically adjusts the size of blocks of data in a packet to suit the reliability of the network connection.

Decrease file transfer times

Upload time *(min:sec)*

02:12	
01:04	
01:00	up to **54**% FASTER

Download time *(min:sec)*

10:07	
01:12	
01:19	up to **86**% FASTER

(lower is better)

Increase network throughput

Upload speed *(Gbps)*

0.30	
0.62	
0.67	more than **2x** THE SPEED

Download speed *(Gbps)*

0.07	
0.55	
0.51	more than **7x** THE SPEED
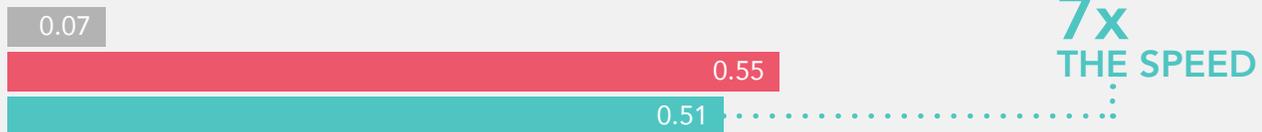
(higher is better)

Reduce network wait times

Average network latency *(ms)*
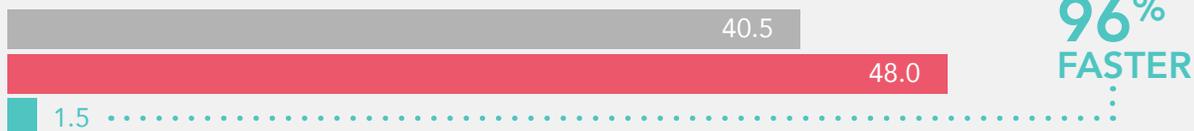
40.5	
48.0	
1.5	up to **96**% FASTER

(lower is better)

■ ISP shared public connection
■ NSP to Equinix to cloud service provider network
■ Equinix to interconnected cloud service provider network

Image provided by Equinix

Conclusion

Of the three hybrid-cloud connectivity scenarios we tested, colocation delivered the biggest benefits. Moving the privately held compute, storage, and networking components of our hybrid cloud infrastructure to an Equinix IBX data center provided significant improvements to application processing speeds. It also provided faster interactions with the web application and decreased network wait times and data transfer times. Leveraging a cloud connection platform to run an enterprise workload allowed us to maintain control and ownership of strategic parts of the IT infrastructure while enjoying the benefits of secure, private access to public clouds through direct interconnection. When you partner with Equinix, you are truly thinking outside your on-premises data center.

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1   Principled Technologies website, accessed January, 14, 2020,
    http://www.principledtechnologies.com
2   Equinix Cloud Exchange Fabric, accessed January, 14, 2020,
    https://www.equinix.com/interconnection-services/cloud-exchange-fabric/
3   Equinix Solution Validation Centers, accessed January, 14, 2020,
    https://www.equinix.com/services/consulting/solution-validation-center/
4   Transform your Business at the Digital Edge video, watched January 17, 2020,
    https://www.equinix.com/digital-edge/
5   Equinix Cross Connects Data Sheet, accessed January, 14, 2020,
    https://www.equinix.com/resources/data-sheets/cross-connects/
6   Performance Hub website, accessed January, 17, 2020,
    https://www.equinix.com/services/performance-hub/

Read the science behind this report at http://facts.pt/a5220x ▶

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This project was commissioned by Equinix.