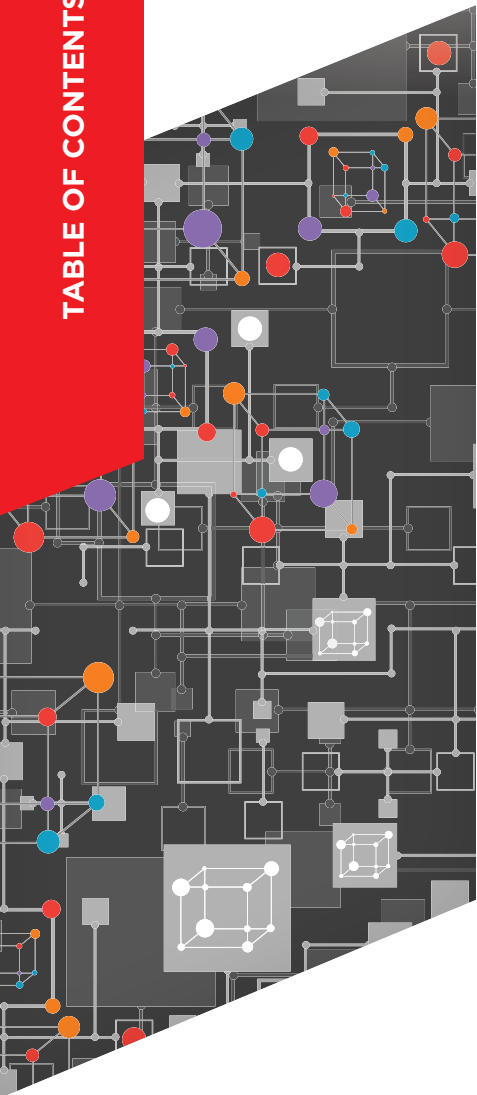EQUINIX

WHERE OPPORTUNITY CONNECTS

UNDOING IMPOSSIBLE:
THE RISE OF THE INTERCONNECTED ENTERPRISE

EQUINIX WHITE PAPER

TABLE OF CONTENTS

EXECUTIVE OVERVIEW

The next phase of the digital economy will exponentially increase the world's connectivity expectations, requirements and opportunities. Factors driving this shift include:

- The growing interdependence of enterprises, which need to collaborate globally within digital ecosystems of employees, partners and customers to grow and create new value

- Escalating expectations from today's social and mobile digital users, who demand immediate service at the speed of touch, with no disruptions

- The rise of the "omnichannel" generation, who consider anytime, anywhere, any device connectivity a way of life

As the world's interconnectivity demands increase in scope and size, enterprises need to differentiate themselves by reimagining their approach to deliver growth, speed, security, scale and engagement. Whereas existing strategies may effectively enable organizations to realize one or more of these enterprise priorities, the reality is that today's businesses must find a way to simultaneously achieve them all within the next few years to remain competitive.

Many might say this is flat-out impossible. Inevitably there are tradeoffs to be made. Surely no one strategy can make a significant difference across all these imperatives. But senior leaders who embrace advanced interconnection strategies to remake their IT and network infrastructures will discover that all of these challenges can be effectively tackled at once. And those that move aggressively to change their mindset and their methods will position their enterprises to "undo impossible" and shape the future of things to come.

THE ROAD TO THE INTERCONNECTED ERA

In the groundbreaking 1995 book, "The Digital Economy: Promise and Peril in the Age of Networked Intelligence," Don Tapscott described an economy based on digital technologies that was "not simply about the networking of technology, but about the networking of humans through technology." Looking back over the past 30 years, four eras of technological transformation have shaped the digital economy and forever altered modern life. At the center of all this radical change has been one pivotal catalyst: connectivity.

We Are Here

The Interconnected Era

Today, we have reached the "Interconnected Era," where SMAC (social, mobile, analytics and cloud) dominates and enterprises forge advantage by collaborating in interdependent ecosystems to create greater value for their customers. The demands placed on connectivity have reached a new high—secure, reliable and internetworked connections among many participants are needed to compete and succeed. Today's businesses need interconnectivity that's instant, direct, massively scalable and more flexible, safe and robust than its predecessors.

The Connected Era

In the "Connected Era," networks evolved into open thoroughfares for globally transmitting information. People could access data beyond their own PC, local area network (LAN) or wide area network (WAN) quickly shrinking the distance between businesses. This era ultimately morphed into a time of constant "anytime, anywhere" connectivity, made possible by new mobile, cloud and social media technologies.

The Networked Era

In the subsequent "Networked Era," businesses needed a new breed of connectivity to succeed. Data networks grew with the mass market adoption of PCs, transforming computers from standalone boxes to connected systems. As more people, companies and information became networked, the groundwork was laid for the biggest transformation of all: the Internet.

The Computing Era

The "Computing Era" began when mass market computing took off in the '80s, sparking unprecedented productivity gains in business and personal computing though IBM mainframes and WINTEL-based PCs. But when it came to connectivity, there were still significant limits. The automated capturing, processing and distributing of data only happened on a proprietary computer-by-computer basis, requiring information to be manually moved from system-to-system via tape or disk.

MAKING THE CONNECTION:
THE INTERCONNECTED ENTERPRISE

Today, the surge in the number of people, locations, clouds and data any one enterprise needs to manage on a daily basis has spurred the trend of "interconnectivity hyper-activity." Consider:

- The number of people connected via the Internet has exceeded 3.1 billion, more than 40% of the world's population, and that number is growing daily.[1]

- By 2020, there will be 25 billion connected things due to the Internet of Things, including seven different connected devices per person.[2]

- New global data is expected to increase the revenue from worldwide goods, services and finances to an estimated $85 trillion by 2025.[3]

- By 2018, global cloud traffic will nearly quadruple to 6.5 zettabytes (ZB) per year, representing over three-fourths of the total data center traffic of 8.6 ZB.[4]

All of this digital growth is exacerbating pain points that already existed within enterprises. By transforming into an interconnected enterprise, you can proactively address all of these emerging trends within a single platform and from a place of leadership and differentiation.

As an interconnected enterprise, your organization can expect to see immediate business advantages, including:
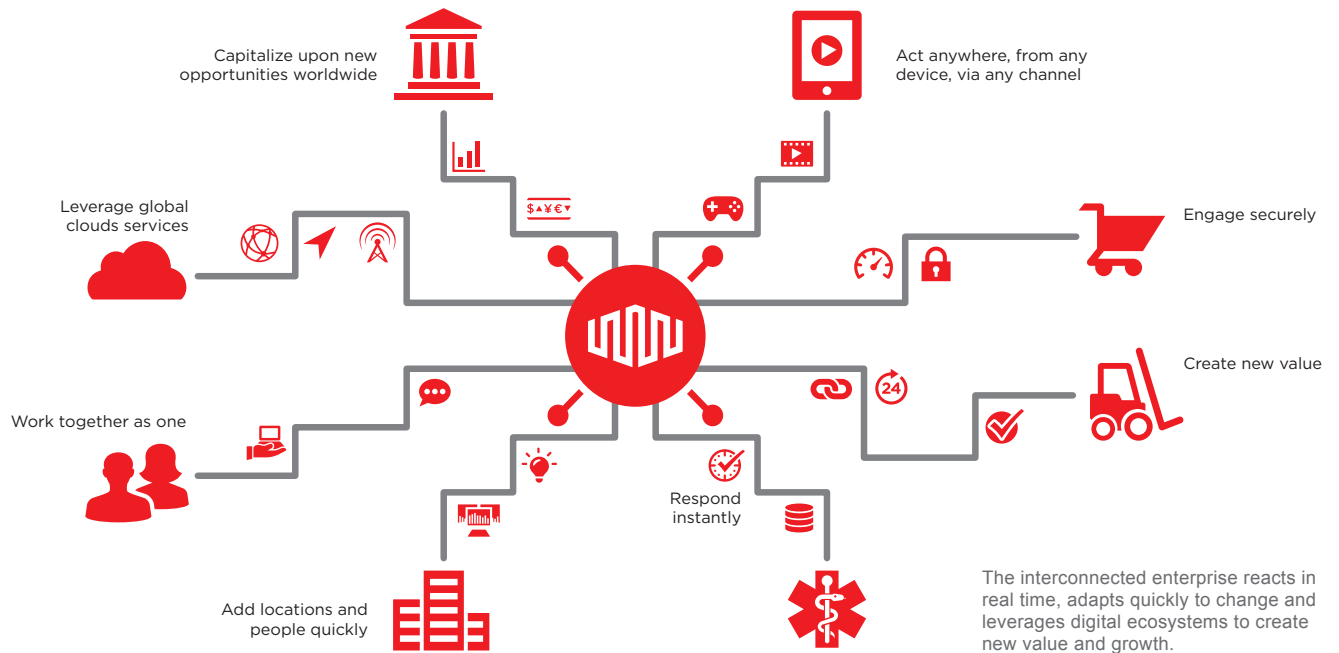
- **Growth** – the ability to rapidly expand into new markets, tap new channels and master new engagement models

- **Speed** – the capability to significantly reduce the amount of time it takes to deploy new services to fluidly connect new users, locations and providers

- **Security** – the ability to achieve the superior physical and virtual data security required to meet and exceed growing risk and regulation requirements

- **Scale** – the ability to do more—scale IT infrastructure capabilities to support new and expanding business workloads—with less "per unit" overhead cost

- **Engagement** – the expertise to connect employees, partners and customers—wherever they are in the world—to what they need, using the devices, channels and services they prefer

1. Internetlivestats.com, 2015.
2. Gartner, 2014.
3. McKinsey, "Global Flows in a Digital Age," 2014.
4. Cisco, "Cisco Cloud Index," 2014.

Capitalize upon new opportunities worldwide

Act anywhere, from any device, via any channel

Leverage global clouds services

Engage securely

Create new value

Work together as one

Respond instantly

Add locations and people quickly

The interconnected enterprise reacts in real time, adapts quickly to change and leverages digital ecosystems to create new value and growth.

Interconnecting People, Locations, Clouds and Data

The interconnected era's increased requirements for real-time interaction, collaboration and participation bring big new challenges to the enterprise doorstep. Namely, the need for a transformative approach to interconnecting people, locations, clouds and data within an integrated platform that transcends today's legacy connectivity models. Organizations looking to become interconnected enterprises must meet these challenges head on.

Your first priority is to fully embrace an interconnected mindset. This means making an unconditional commitment to connect global users to what they need, in the right context, using the devices, channels and services they prefer. This includes being able to fluidly facilitate how systems, applications, data and clouds interact to keep the business running productively and cost-effectively. This shift in thinking is a vital first step in the journey to becoming an interconnected enterprise. But the benefits are well worth the trip. Your interconnected enterprise will be primed to react in real time, adapt quickly to change and leverage digital ecosystems to create new value and growth in our increasingly competitive world.

Interconnecting People

No doubt one of the biggest challenges facing your enterprise today is the need to connect your growing community of globally distributed, mobile- and socially- engaged employees, partners and customers. Enterprises that attempt to address this increasingly dynamic user base with existing siloed organizations, IT-centric infrastructures and legacy networks experience a number of pain points, such as:

- **Poor user experience** – If your users cannot access the information they need, when and how they want it, their satisfaction and loyalty decreases, and your company's reputation and growth can suffer. Today's digital users expect their IT organizations to deliver an experience that can stand up to their consumer buying experiences, where they can instantaneously access what they need, regardless of location, device or channel.

- **Greater engagement, execution and collaboration** – Interconnecting people is all about efficiently and effectively engaging customers, empowering employees and collaborating with business partners. Enterprise customers are defining their own forms of engagement with the companies that they do business with. Given how social customers have become in their personal lives, they also expect the same type of interaction when doing business, giving rise to social customer service portals. In addition, companies that cannot foster greater employee productivity to execute on their business plans quickly lose their competitive edge. And it's not only your employees who need to be more connected. Enterprise business models are increasingly interdependent and must support seamless collaboration among partners working within industry ecosystems. Without a consistently high level of engagement, your strategies cannot be executed effectively and your products and services cannot be brought to market rapidly.

- **Looming threats and cyber-security** – Insecure (personal) devices, running in insecure locations, across insecure connections, accessing Internet-facing enterprise services and data, combine to create a significant risk profile that seems to be out of control. Enterprises need an interconnection platform that scales with the level of integrated security required to prevent any type of intrusion.

- **Increasing complexity and cost** – As people have become more geographically dispersed and mobile, the complexity and cost of corporate networks have increased. Many enterprises are still requiring users to come to the information, applications and services they need, rather than simply and more cost-effectively distributing these resources closer to the user.

As an interconnected enterprise, you will overcome the hurdles of connecting people by:

- Providing a fast, reliable and secure interconnection platform that is responsive to the anytime, anywhere, any device requirements of your users

- Being less IT-centric and more user-centric, giving your users on-demand access to each other, applications, data, and business, network and cloud ecosystems, which increases their satisfaction and productivity

- Giving you the flexibility and agility to quickly and cost-effectively stay in step with the needs of your more distributed and mobile user base, new business models and emerging technologies

Interconnecting Locations

Location matters, as does a superior worldwide interconnection footprint. The connectivity provided by MPLS-based WANs and Internet-based virtual private networks (VPNs) limit your enterprise's ability to quickly and cost-effectively deploy location strategies that drive greater global growth and local productivity. Like many enterprises working to interconnect locations, you may have faced:

- **Costly and risky global expansion** – Many businesses see global expansion as their next big growth path, but creating IT infrastructures in remote geographic locations and going into emerging economies is a huge CAPEX and OPEX investment that introduces a new level of operating risk. It is not always possible to ensure the quality and security of global interconnections that travel over the public Internet, which can be latency-prone and difficult to manage and secure. And throwing more bandwidth and connections at the problem doesn't solve the physics behind high latency. It only adds more costs.

- **Disconnected supply chains** – Many enterprises need to be able to interconnect and collaborate within business ecosystems on a global basis to support valuable supply chains. Think about how today's mobile retail experience combines e-ecommerce, social media and online payments. Without high-performance and on-demand connectivity, these interdependent processes falter and translate into a subpar consumer experience.

- **Poor operational efficiency and business insight** – Close coordination among partners helps businesses maximize their operational efficiency and minimize their costs across their global manufacturing, transportation and distribution entities. Businesses that lack proximate interconnection among their partners, online data and real-time analytics also find it tough to leverage operational intelligence to make the right decisions quickly. The waste generated from miscommunication, or the inability to react to an unforeseen event, equates to lost time and money.

As an interconnected enterprise, you will meet the challenges of connecting locations by:

- Simplifying and expediting your worldwide growth and market penetration via distributed data center/IT colocations. This reduces CAPEX and OPEX by providing access to more cost-effective local expertise and network and cloud services.

- Providing proximate, real-time interconnection to facilitate global supply chain participation and interaction across your global users

- Coordinating your partners, tools, data and analytics in real time to ensure that all your operations are running efficiently and effectively, and the right business and solution development decisions are being made at the right time

Interconnecting Clouds

Today's enterprises have realized there is no time benefit or business value to gain by reinventing technology services that already exist in the cloud marketplace. Even though cloud adoption is growing, many businesses are struggling with interconnecting services across multiple cloud environments—whether they be private, public or hybrid, or Infrastructure-as-a-Service, Software-as-Service or Platform-as-a-Service.

Some of the most common issues currently associated with enterprise cloud adoption include:

- **More cyber-security exposure** – Recent events have proven the Internet's unreliability and the associated business and reputational damage that security breaches pose.

- **Efficiently accessing and scaling the cloud** – Enterprises seeking the benefits of cloud services are faced with decisions such as whether to use dedicated Internet links to each cloud provider and how to connect to multiple cloud providers in a secure, flexible and cost-effective way. In addition, "backhauling" increasing amounts of cloud traffic to the enterprise data center, rather than distributing it to data center locations closer to the users, is expensive to scale and negatively impacts performance.

- **Hybrid and multi-cloud operations management** – As hybrid and multi-cloud implementations increase, operations teams are realizing they need to proactively monitor business processes and systems that cross many types of providers. It's a very complex challenge to analyze the interconnectivity, usage, security and performance of application systems across multiple clouds, the traditional data center and mobile users at the edge.

As an interconnected enterprise, your cloud adoption challenges will be removed because your network and cloud interconnection will be delivered via a fast, secure and reliable, API-based platform that enables your enterprise to:

- Bypass the public Internet and connect directly in a one-to-many fashion, fully benefiting from private, hybrid and multi-cloud services without security concerns. You will also be able to layer on custom security services geared to protect your sensitive customer corporate assets.

- Easily access and scale cloud services within a distributed data center/IT fabric by provisioning virtual connections on-demand through a more cost-effective single physical connection

- Deploy the highest-performing, lowest-cost access methods to hybrid and multi-cloud infrastructures and integrate the operational management tools required to prevent outages and performance degradation

Interconnecting Data

Most enterprises have siloed their corporate data, making it difficult to access, only to find that it has become one of their company's most underutilized assets. Forecasts predict that within a few years, the amount of data generated by most enterprises will surpass their ability to cost-effectively store, protect, access and analyze it to make critical business decisions—let alone accomplishing this in a timely fashion or as required. In addition, data will also form the basis of new products and new business differentiation. The thirst for data-driven business insight, combined with the ongoing surge of data, will continue to challenge your enterprise on many fronts, including:

- **Where to put it all** – Traditional storage is cost-prohibitive and simply cannot accommodate the massive surge of data enterprises are experiencing. As the data grows, companies tend to consolidate it in an effort to better manage and protect it. But this places it farther away from the enterprise users, applications, analytics and cloud services that need it the most. Consolidating data also makes it difficult to deploy reliable and cost-effective disaster recovery solutions, which is why many savvy enterprises are turning to dispersed storage (as offered in the cloud) for this function.

- **Big data, little bandwidth** – Enterprises' ability to manage large amounts of data is limited by legacy MPLS links and lack of cost-effective bandwidth. Connecting to data sources over the Internet is not an acceptable alternative because it increases the risk of cyber-threats and inconsistent performance. And data corruption, whether in transit or at rest, has the same impact as data loss. Effectively and efficiently managing fluctuating data and network capacity is vital to saving your enterprise from costly over-provisioning, or worse, under-provisioning. Data interchange needs to occur on a secure and reliable interconnection platform.

- **Data security, locality and compliance** – Different governments, regulators, and internal risk/audit functions maintain rules about how data can be handled, where it can be stored and how long it needs to be retained. In a multi-cloud, massively mobile environment with geographically dispersed markets, you will increasingly be juggling various security, location and compliance requirements.

As an interconnected enterprise, you will overcome these data connection challenges by:

- Implementing a data fabric and distributing massive amounts of data where it is needed most, in a way that is more easily managed and protected, can provide direct, proximate interconnection across businesses, data, analytics and clouds, and create an integrated data supply chain—an end-to-end process that is based on real-time information, outcome-driven and aligned to your business strategy

- Providing a high-speed, low-latency interconnection platform that includes the intelligence to allocate bandwidth on-demand and alleviates fluctuating capacity issues at less cost than current connectivity

- Enabling safe, reliable and flexible connectivity that embeds security services closer to your users, permitting sovereignty control and the ability to reconfigure that locality should compliance regulations change

While competitive enterprises struggle to painstakingly jump these four hurdles of interconnecting people, locations, clouds and data with strategies that address each one separately, your interconnected enterprise will achieve the impossible by addressing all of these challenges at once. Your integrated strategy will be affordable and easy to implement, and it won't disrupt your legacy operations. It will also be flexible and modular enough to expand incrementally as your business grows.

To achieve this higher level of interconnection and deliver the same quality of experience whether you are interconnecting people, locations, clouds or data, you need to rethink your IT infrastructure. Your commitment to transform your business into an interconnected enterprise will lead you to reject status quo organizational silos, IT-centric infrastructures and legacy networks and build a more user-centric distributed interconnection-oriented platform. Once you remove the roadblocks preventing your enterprise from connecting people, locations, clouds and data, you will dramatically increase your organizational capacity to grow, innovate, engage important audiences, leverage a market of innovative partners and create new value with greater speed. Becoming an interconnected enterprise will also allow you to evolve into a "platform company" that provides additional value to the solutions that you deliver—think Amazon Prime and its ability to provide consumers with enhanced shopping and delivery options.

Growth Realized

Be primed and ready to expand into new markets and develop new channels and models for user engagement. Your interconnected enterprise will allow for fast and cost-effective global expansion, joining your users and applications across distributed regions with consistent "local" performance. It will integrate distributed locations through physical and virtual network topologies and regional proximity to seamlessly interconnect your corporate offices, data centers, remote branches and expanding mobile workplace, with lower risk and cost. Should growth come in the form of a merger and acquisition, leverage the adaptable interconnection platform to connect and quickly integrate that acquired asset.

Speed Gained

Expedite access to cloud services to achieve greater agility, scalability and speed to market. Ubiquitous, high-speed interconnections to people, locations, clouds and data will fuel the growth of your enterprise. Quick access to multi-cloud services will equip you to take advantage of innovations you may have not previously been able to pursue and bring more products and services to market more quickly. Major business shifts are difficult to predict, but a flexible and agile interconnection platform can readily adapt to accommodate evolving interconnectivity requirements.

Security Strengthened

In an age of frequent, damaging and highly publicized data breaches, companies may be seeking more secure alternatives to the public Internet. Protection requires bypassing the public Internet and placing essential security services close to the user within a physically and virtually secure interconnected data center platform. Private connectivity between your source and destination locations means all of your methods of engagement are not visible to most cyber-threats, significantly reducing your exposure and making your IT infrastructure more secure, risk-free and equipped to protect valuable digital assets. It also ensures that you are meeting regional compliance regulations.

Scale Achieved

Stay ahead of your customers' needs while controlling expanding workload requirements and costs. Within your interconnected enterprise, your business will create value by better utilizing previously untapped data. Real-time analytics at the point of workload origination will give you new operational insights that reduce waste, power greater efficiencies and offer new revenue opportunities.

Engagement Heightened

Achieve a higher level of engagement within dense ecosystems of partners, networks and clouds to ignite new collaboration, innovation and growth. Your interconnected enterprise will enable your employees, partners and customers—wherever they are in the world—to gain access to what they need, using the devices, channels and services they prefer. A better user experience will improve your customer retention and employee productivity.

SUMMARY

The interconnected enterprise shifts the connectivity paradigm from siloed business units and IT-centralization to a flexible platform that is primed to consistently and reliably support the vastly distributed users, increasingly global IT locations, highly collaborative business models, expanding amounts of data and growing cloud universe that dominate our world.

Your interconnected enterprise will be better positioned to react in real time, adapt quickly to change and deliver unprecedented growth, innovation and value in ways that were once considered impossible.

EQUINIX®
WHERE OPPORTUNITY CONNECTS

Corporate HQ

Equinix, Inc.
One Lagoon Drive
4th Floor
Redwood City, CA 94065
USA

Main: +1.650.598.6000
Fax: +1.650.598.6900

Email: info@equinix.com

EMEA HQ

Equinix (EMEA) BV
Luttenbergweg 4
1101 EC Amsterdam Zuidoost
Netherlands

Main: +31.20.753.7950
Fax: +31.20.753.7951

Email: info.eu.equinix.com

Asia-Pacific

Equinix Hong Kong Limited
Suite 6504-07,
65/F Central Plaza
18 Harbour Road
Wanchai, Hong Kong

Main: +852.2970.7788
Fax: +852.2511.3309

Email: info@ap.equinix.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 33 markets across five continents, Equinix is where companies come together to realize new opportunities and accelerate their business, IT and cloud strategies.

In a digital economy where enterprise business models are increasingly interdependent, interconnection is essential to success. Equinix operates the only global interconnection platform, sparking new opportunities that are only possible when companies come together.

Equinix.com