EQUINIX®

WHERE OPPORTUNITY CONNECTS

THE EDGE OF THE
INTERCONNECTED ENTERPRISE
# VALUE CREATION AT THE
# POINT OF ENGAGEMENT

EQUINIX WHITE PAPER

# EXECUTIVE OVERVIEW

**Organizations around the globe must be focused on achieving growth in an ever-evolving digital economy. Growth must come from new products and services, expansion into new global markets, acquisition of new, more digital-, social- and mobile-savvy consumers and, of course, any opportunity to attract new business from competitors. In order to support initiatives that will grow a business, an organization's technology capabilities must not only scale in concert with the growth, but must be fundamental enablers of growth.**

**Technology should deliver increased value and capacity, enable new business models and methods of user and partner engagement, and also become the basis of new digital products and services. These models, engagements, products and services need to be delivered not only in an organization's emerging markets, but wherever the user happens to be. In a digital environment with no shortage of devices (smartphones, tablets, wearables), delivery channels (mobile, social, cloud) or connectivity options, this point of engagement could be anywhere at any time.**

This point of engagement for all users becomes the opportunity for value creation, for customers, employees or partners, and for the enterprise itself. It is this point of engagement that now defines the boundary between supply and demand, between supplier and consumer. In order to be successful in today's digital economy, a positive user experience is paramount—especially since more and more of the experience is taking place without physical interaction or presence.

Apart from the organization's physical locations, users are constantly exposed to its digital footprint, personality and presense, as well as the important social media and reviews of the organization's overall capabilities from the community of previous users. The quality of their experience and the performance of the organization through services, applications and data must be exceptional. This exceptional level of user experience and performance can only be achieved closer to the user via high-performance, low-latency connectivity to the edge of the supplier's network.

As more and more business functionality and content gets pushed to the edge, organizations must re-architect their IT infrastructure and delivery models to be less corporate data center-centric and more geographically distributed and localized. Any localized housing of applications, services and data must include real-time intelligence and content, but also be comprised of more flexible and agile IT infrastructure that can be duplicated at any location—either owned or outsourced. This localized housing should include a more interconnected-oriented approach. It must be automated, capable of remote management and have the modularity necessary for ease of delivery and downstream expansion.

Business and technology functions across the organization must juxtapose their goals and capabilities in order to become an interconnected enterprise that is not only capable of competing in the new digital economy, but is also positioned for growth, profitability and maximizing shareholder value. Chief information officers (CIOs) and senior technology leaders must be more aware of user expectations, requirements and growth. Being more user-centric in their IT strategies will enable these leaders to erase the barriers between business and IT silos and deploy an entirely new level of interconnection at a more localized point of engagement, as physical and virtual worlds continue to converge.

This boundary between an organization's suppliers and consumers represents the edge of the organization's capabilities. It is at this edge that an organization must attract and retain the user and then continually meet or exceed expectations, both through products and services, but also through the overall experience. Whether it's in-store shopping or transactions through a virtual storefront, the user has very high expectations—not only about the goods and services, but also the overall experience of the interactions. These expectations and experiences are not only spur-of-the-moment, but are also conditioned through social media, customer care, online product and company reviews and competitive pricing searches.

To deliver the anticipated user experience, the enterprise must meet the user at their location and through their device and channel of choice. Analysis from 451 Research[1] has shown enterprises must increase their focus on a robust interconnection platform when considering their geographically distributed technology model. It's also critical to continually assess the physical footprint that houses the IT needed to optimally deliver distributed business and technology services to the target audience, so that the enterprise doesn't propagate too much data or infrastructure.
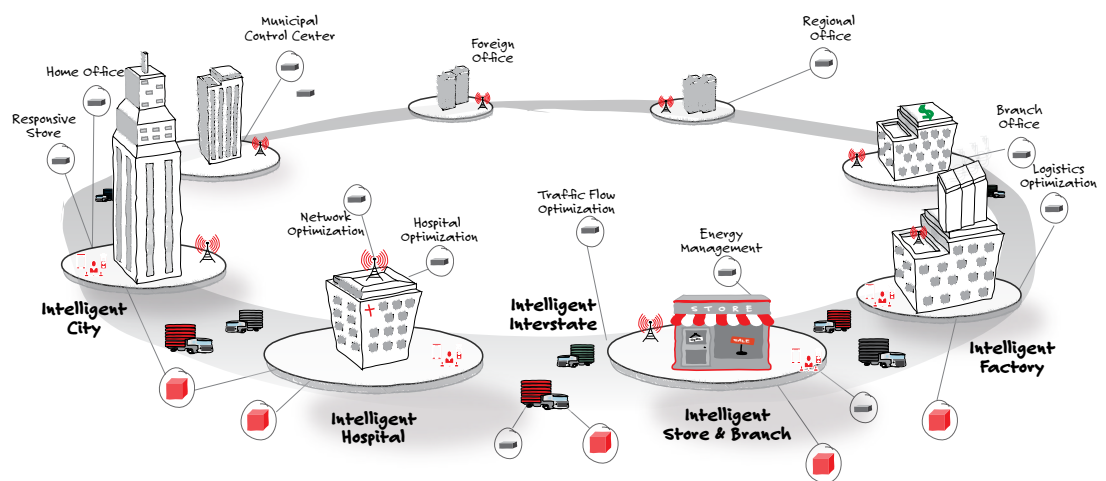


Figure 1: 451 Research's Edge Data Center Model

The battle lines of the digital economy are no longer defined solely by the competition, but also by an organization's ability to acquire, satisfy and retain customers, employees and/or partners. The battle therefore has two fronts: encroachment directly from competitors and the erosion of opportunity from the loss of users or their lack of support and endorsement through digital review and feedback mechanisms.

Losing on either of these two fronts can be catastrophic to an enterprise. An organization's business and technology leaders need to carefully adapt to the channels of engagement users prefer and make those interactions as rich, productive and hassle-free as possible. High-quality connectivity between applications, services, data and content needs to be enabled at or near the point of the user's engagement. This proximity will allow for high-performance response and engagement, consistency of experience and enable hyper-mediation without continually traversing the globe to support each digital interaction.

1. The 451 Group. (2014). The Digital Enterprise Playbook Series: Edge Data Center Playbook. New York: 451 Research LLC.

# VALUE CREATION

The edge of an organization is where the transition is made from supplier to consumer. This is the point of value creation. Whether physical or virtual, this is the point where users make assessments and discuss their experiences. Here, they evaluate an enterprise based on their interactions and experience and most often make decisions on the nature of their continued business relationship and ongoing loyalty.

This point of engagement is where the organization can present its best face, offer its products and services, provide notable differentiation, and quite often expose and highlight the reviews and ratings of past customers and partners in an attempt to conduct a new business transaction. The organization must harness all of its business intelligence, make its best offer, streamline the user interaction and realize the anticipated value from the interaction.

From a customer or partner perspective, the point of engagement is also the point of value creation. It is at this juncture that they witness, judge and decide about the organization and its goods and services—from the outside, looking in. Whether they consult past customers' or partners' experiences, make determinations based on advertising, promotion or brand recognition, or make decisions on price alone in absence of other factors, this is where value creation occurs. When a consumer takes action, it sends the signal to the supplier that value is being created.

The same paradigm exists for enterprises and their employees, where the point of engagement may be the mobile or remote workplace. Whether driven by employment models or employer deployment programs, work relationships require the ability of the employee to be remote and receive nearly the same quality of experience (QoE) as if they were onsite at their office. The value created for the employee is the flexibility to work remotely or offsite to accommodate personal and family circumstances, provide relief from commuting challenges or offer lifestyle flexibility. For the enterprise as employer, the value is realized with a productive and engaged employee, regardless of physical presence, and increased employee retention.

The point of engagement can either be physical or virtual. Prior examples of a physical store's location versus an electronic storefront for the retail consumer model, and onsite versus remote for an enterprise's employees in a workplace model, are easy illustrations. Every industry has an exploding set of illustrations that further the discussion of either physical presence or electronic interaction and the concept of local versus remote. Medical diagnosis being performed thousands of miles from the patient based on real-time monitoring in healthcare or the tracking of shipments with real-time location status and immediate delivery confirmation are two other industry examples.

If an organization's edge is defined by where it transitions from supplier to consumer or from employer to employee, then this edge can and should follow and correlate to the point of engagement. From a business and technology delivery perspective, what must be enabled at the edge is the ability to engage the user and to create value for both entities.

The edge, therefore, can be finite. It is typically defined by actual sites, the associated real estate and actual physical footprint for both business presence



Figure 2: 451 Research's Edge Data Center Point of Engagement Model[2]

from the user's perspective, and often includes aspects of an organization's technology perimeter. Those might be obvious in stores, hospitals, classrooms and warehouses, but other extremes, like remote natural resource mines, oil extraction platforms or even toll plazas, are other illustrations.

The virtual edge is usually not defined by a single location or a singular purpose, but by the more ubiquitous examples of mobile devices (such as smart phones, tablets) and other interfaces on the horizon, like automobile dashboards and wearable devices connecting to tens or hundreds of applications.

So, the edge can be local or remote, finite or ubiquitous, human or sensor-driven, and physical and/or virtual. The enterprise must be an interconnected enterprise in order to equip each model to provide the best possible experience and performance to the customer, employee or partner.
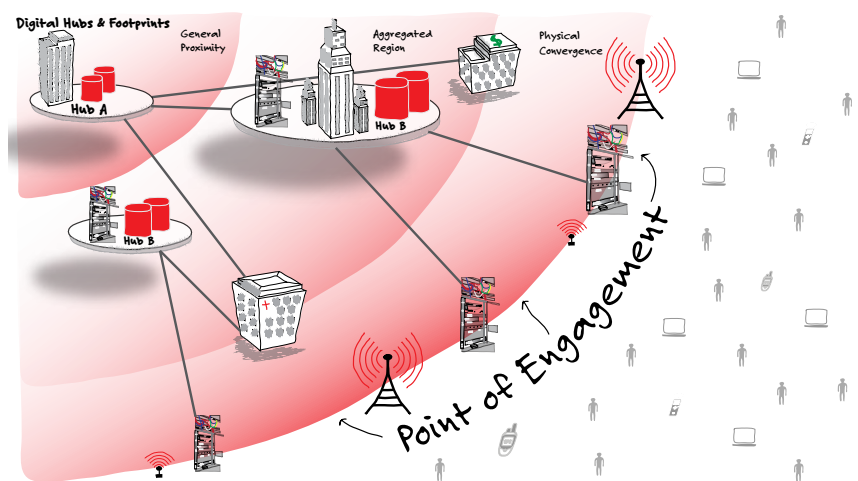
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2. The 451 Group. (2014). The Digital Enterprise Playbook Series: Edge Data Center Playbook. New York: 451 Research LLC.

# ENABLING THE EDGE

If value creation is at the point of engagement and the point of engagement defines the edge, then it is paramount that the enterprise delivers the optimal combination of services, user experience and performance possible at the edge. Since the edge is either physical or virtual, or a combination of the two, each enterprise must evaluate its edge model very carefully.

This must be done from the outside in, from the customer or partner or employee back into the enterprise. Careful consideration must be given to the type and nature of any user engagement, including:

- use of devices, channels and medium of interaction
- the diversity of location(s) from which the user may interact
- use of applications, workload and workflow to support the interaction
- what data and content is needed to satisfy the typical interaction
- how they push the business presence as close to the edge of interaction while obscuring the technology presence that can maximize the value creation, physically or virtually

In order to ensure high-quality user experience and engagement to the edge, organizations must build an interconnection-oriented architecture. Fast, secure interconnection among users, as well as systems of record and engagement, is critical. Proximity of data and application to the user ultimately becomes paramount. Therefore, an organization must balance how much technology should be deployed into a geographically distributed footprint that may have a ubiquitous access model. The balance has to accommodate the physical presence, when and if required, and the extreme model of always on and always available from any location.

For bricks and mortar scenarios, there are drivers for small technology footprints housed locally that enable local business operations and provide basic customer engagement and transaction capabilities. Certainly, organizations will have to consider availability, remote manageability, self-contained security and the obvious prerequisites of connectivity and backup capability. The physical technology that is housed locally may be very minimal, or perhaps a small, self-contained modular approach consisting of very basic IT equipment. Whether the enterprise is connected to a store in a mall or to a remote mining operation, the edge will require some local housing of IT components. Working from the outside in, the edge will need to be connected and fed from a more regionalized connection point for extremely wide enterprise topologies, those topologies that span large distances and multi-layer structures for applications and data placement throughout and between geographies.

For cases where there is no brick and mortar or specific physical place of user interaction, the edge is completely virtual. The user experience is remote, but remains connected and driven by mobile or Internet access at all times. Organizations face a greater and more complex challenge here of how to push as much function and data to the edge without populating more data centers or closets than necessary. The user experience at the edge becomes even more critical, since it is not supported by a local representation of the organization, as it would be by sales personnel or trained medical staff, as seen in earlier examples.

The balance sought by the organization is how much to retain at core operations sites, while ensuring the same level of fast, secure interconnection to the outer layer of the enterprise edge and maintaining a consistent user QoE. Colocation options become attractive, particularly when trading partners or other service providers are within the same facilities. Access to the local Internet providers and mobile carriers also becomes a large consideration, so that these providers can carry the function and the data of the enterprise over "the last mile" to the point of actual user engagement.

For CIOs and senior technology leaders, the balance must include cost and other ownership and operational factors. In order to have a more localized presence, basic considerations must go into any evaluation, including ease of maintainability, security at remote locations, monitoring and remote manageability, and even future repairs or replacement of any equipment. For slightly larger physical footprints, the form factors, power supply and potentially even cooling may become considerations.

There will be tradeoffs and tipping points between a local converged, modular package of IT capability, versus a purely virtual presence at a localized service provider through a digital hub. Ultimately, there needs to be transparent interconnection to bridge core and edge operations, such that the corporate data center is viewed as just another edge point within the network topology.

Equinix enables a geographically distributed and integrated footprint through its ability to aggregate application and data delivery capabilities, content distribution, policy enforcement points, carrier connections, and cloud services and mobile services, and to enable a seamless interconnection platform. It offers intelligently monitored and managed value intermediation on a regional basis across the globe.

Equinix also recognizes the need for firms to incorporate a hybrid model of their virtual/physical footprints into a smart and converged footprint housed on-premises, combined with regionalized servicing hubs that allow the enterprise to operate locally, nationally and globally. This is an edge data center strategy (physical, logical, aggregated, interconnected and dynamically controllable). Enterprises that require brick and mortar as the last stop between the user and the business can easily utilize Equinix's regional capabilities in every major geography.

Equinix is uniquely positioned and is already supplying infrastructure for thousands of interconnected enterprises that have been or are well on their way through a digital transformation. Equinix can help the enterprise build a new interconnection-oriented architecture that integrates the physical and virtual worlds on a single platform. Equinix not only has a physical presence in 33 markets around the world, Equinix lets you directly interconnect with every major global network and ISP to satisfy your peering, transit and traffic exchange requirements. Whether operating as an Internet or mobile end point for local user access or housing local application and data services, Equinix has the locations and connectivity to broaden any enterprise's placement and proximity capabilities. Equinix can provide the infrastructure and access to the world's largest collection of carriers for enterprises to design a performance-oriented backbone and integrate with an enterprise's existing network topology. This gives the digital enterprise a hybrid infrastructure without the long-term commitments of ownership and support. Equinix offers a growing list of capabilities that span locations, connections and other potential partners for each enterprise. We help move connectivity from siloed business units to a flexible, user-centric platform that supports distributed users and collaborative business ecosystems.

### Locations and Proximity
Equinix operates across five continents today with more than 100 facilities in 15 countries. Equinix is already where most digital enterprises want and need to be. It has over 11 million square feet of data center capacity under management. With over $7.5 billion in infrastructure investments since 1998, Equinix delivered better than 99.9999% availability across its global portfolio of data centers in 2014.

### Connectivity
With Equinix's tremendous network of sites, unmatched portfolio of connectivity options and proper placement of applications and data, you can reach the major markets of the Americas, Asia and Europe in less than 1/100th of a second. Across the globe, Equinix supports over 160,000 connections with access to over 1,0100 networks and 500+ cloud providers, making Equinix the leading global interconnection platform providing core sites, critical high-speed interconnects and convenient on- and off-ramps to the digital economy.

### Global Marketplace
With more than 6,250 customers, many of Equinix's clients are themselves digital services providers to other clients and to each other across this networked economy. Equinix provides the broadest interconnection platform, not just for digital infrastructure, but also for sourcing IT and business services. Equinix provides a shared digital economic zone across geographies, business markets and industries.

### Solution Validation
Equinix provides unique skills, tools and proven procedures for the design, validation and optimization of projected and ongoing implementations of a digital topography. At eight locations around the world, Equinix has established, staffed and equipped Solution Validation Centers™ that are available to assist an organization with the expansion or enhancement of their digital presence or implement a geographically distributed infrastructure within a country or across continents.

# THE TIME TO ACT IS NOW

The level of digital economic activity and the robust competition for the digital attention span of the typical user continues to intensify, and organizations are compelled to re-examine their current edge strategy. The traditional emphasis on consolidation and centralization of applications, services and data is obsolete. The diversification and quantity of physical locations and electronic channels used to engage the user puts a premium on secure, fast, interconnection across borders and business ecosystems.

Diversified target audience locations, along with the richness of their interactions, signals a need to revisit the waves of business and technology capabilities from the enterprise core out to more regionalized hubs and the physical or virtual edge—this is a key differentiator provided at Equinix.

To start, organizations should at a minimum conduct a profiling of those that access, interact and consume products and services, to understand the demographics and patterns present. Armed with this information, a placement exercise should look at whether the target business models and engagement models are optimized to maximize the interconnection between the partners and ecosystems needed to deliver the highest quality user experience and performance.

To complete the analysis, organizations with widely distributed pockets of IT should examine those footprints and housing requirements and possibly reduce those footprints into more appropriately housed locations, or a more self-contained and easily managed converged footprint. Organizations that require a more widely dispersed geographic coverage, or those that find an imbalance of more digitally oriented interactions, should look to leverage the locations of access partners for mobile and/or Internet and the potential to house in-common networking backbones.

The goal is to maximize presence and create value at the point of engagement, while not underserving the digital needs of the audience or having too much isolated IT equipment in too many locations. CIOs and senior IT leaders should explore the opportunities and possibilities available that are already defining, operating and capitalizing on the digital economy and the new value it's creating.

WHERE OPPORTUNITY CONNECTS

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**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.

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