Rethinking the Datacenter with Interconnection to Meet the Data-Driven Business Challenges of the 3rd Platform Era

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IDC OPINION

Business disruption is the predominant feature of the modern world. Disruption is being driven by the digitization of business flows and the subsequent shift of revenue from traditional goods and services to global digital flows of data, which will come to dominate revenue in many industries. Organizations across all industries face a rapid transformation in long-standing ways of doing business and must adapt to the changing expectations related to business scale, business speed, and operational flexibility. In response, information technology (IT) is evolving from being an enabler of back-office business processes to becoming the very foundation of a modern business.

Whether an organization is "born in the cloud" or a multidecade market leader, in today's increasingly digital and mobile world, its datacenter is often the first and most frequent point of contact with customers, delivering both mobile digital user experiences and digital business exchanges. The datacenter is also the repository for growing volumes of customer and machine-generated information that are becoming the most valuable assets to the modern organization. The ability to capitalize on data enables organizations to innovate quickly, engage new customers, and launch new business models. IDC projects that more data-driven and analytically oriented organizations will achieve $2 trillion in extra benefits in the form of increased revenue, lower costs, and improved productivity over the next five years.

A major barrier that many businesses face as they engage in this digital transformation (DX) is the realization that their existing inward-focused datacenters cannot accommodate these new requirements, even with the use of the latest technologies. Digital companies must leverage a broader ecosystem of partners, combining strengths, sharing data, and interweaving new business models that far surpass any individual company's capabilities.

IDC's 2015 benchmark of digital transformation maturity revealed that 64% of enterprises are still in the early stages of transforming their businesses by using digital technologies to drive operations, processes, and business model changes. Only 22% of organizations have arrived at the more advanced stages of DX evolution. They are leaders in digital product/service/experience delivery and actively remaking markets in ways that sustain and accelerate their own competitive advantage through a constant process of disruptive digital innovation.

IDC believes that the approach of DX leaders to datacenter placement and interconnection plays a key role in their accelerated digital transformation. They've used datacenters that enable this evolution to interdependent "extended enterprise" ecosystems that span multiple geographies and consumer bases while quickly providing the needed capabilities that business units are demanding.

When it comes to datacenters, preparing for DX starts by shifting thinking to *interconnection-first,* leveraging optimized solutions such as an Interconnection Oriented Architecture to enable digital platform strategies built on cloud and data analytics that accelerate business innovation, velocity, and agility – what IDC calls the 3rd Platform: the new paradigm for business-enabling IT. The 3rd Platform yields more efficient business operations, new products and services, new ways of engaging with customers, and improved business decision making. For all but the youngest of start-ups, however, it requires the IT organization to redefine its role, engaging in new *digital* thinking about how to interconnect increasingly dispersed pools of in-house and third party-provided IT, application, and data resources. It also requires shifting the IT delivery architecture from siloed and centralized to distributed, colocated, and interconnected.

NEW BUSINESS CHALLENGES RESHAPING IT AND THE MODERN DATACENTER

In the worlds of mobile, social, cloud, big data, and intelligent industries, the datacenter can no longer just be the place where an organization keeps its computers. The datacenter is the foundation for new data-driven business models in a growing set of industries. It's the first point of contact with the organization's customers, employees, and partners, so it needs to be in optimal proximity to provide the best service (experience).

In this rapidly changing era of the 3rd Platform datacenter, it's no longer sufficient for businesses to assess IT requirements solely at the level of individual server and storage systems in individual facilities. Businesses have to think about their requirements at the level of the datacenters themselves. Up until now, the model was to bring users and business to the datacenter, but today, you need to go to where the business and users are and transact locally in that market or population center. Today, 77% of organizations report that in the past 12-24 months, they have expanded the number of data types and sources being used and analyzed; and the same percentage of organizations cite that they have expanded the number of users (both internal and external) with access to data and analytics solutions or all the various digital outputs of those solutions.

What are the primary use cases driving new data access requirements? And how are data location and distance affecting performance (and connectivity costs)?

Adopting a Distributed Approach to Datacenter Planning

The use case that is most familiar to IT organizations is transactional, involving changes and queries to systems of record, usually measured in terms of input/output operations per second (IOPS) data availability. For example, in a sector such as healthcare, this use case can also include medical imaging and records that need to be delivered quickly to healthcare professionals. In today's organizations, however, three new use cases are driving a growing proportion of datacenter expansion, although much of that expansion is not within organizations' own datacenters:

- **Ingesting/serving content (e.g., video, audio, and images).** Retailers are ingesting video surveillance streams, and manufacturers are collecting sensor data. Media companies are serving movies to consumers. The timely delivery or ingestion of content (usually measured in terms of throughput) is the key to better engaging with customers, partners, and employees in today's mobile world. Access to scalable systems of engagement is now the key to boosting customer satisfaction and loyalty, requiring localization of traffic and data.

- **Analyzing large data sets in real time to drive timely business decisions.** Transportation companies are monitoring the movement and performance of their vehicle fleets to optimization logistics. Retailers are responding more quickly to changing consumer purchasing behaviors. Financial services companies are using automated, real-time processing to detect credit card fraud. Atmospheric researchers are improving the timeliness and accuracy of weather forecasts with more flexible high-performance computing systems. Major boosts in access to elastic compute resources and large data sets contained within systems of insight are required to enhance the user experience and deliver material improvements in business outcomes, requiring data proximity to clouds, partners, and the edge.

- **Organizing/preserving information that needs to be archived for a long period.** Research hospitals are preserving genetic sequencing for diagnostic/research purposes. Aerospace companies are collecting and analyzing flight data and component failure data to improve overall system reliability. Retailers of all kinds are capturing sensor data. Cost-effective storage and fast retrieval of data are key to owning and monetizing extremely large, long-term content depots, requiring distributed data lakes fed with data pipelines and optimized connectivity.

The 3rd Platform Alters Datacenter Priorities

The 3rd Platform is both a technology and a business innovation platform for iterative value creation. It integrates heterogeneous IT environments (traditional and cloud infrastructure, SQL and NoSQL data platforms, and packaged on-premises and SaaS software resources). While brokered and orchestrated by the IT organization, a growing portion of these IT assets are deployed in a mix of on-premises and/or off-premises facilities based on cost, performance, agility, and compliance criteria. 3rd Platform accommodates new organizational boundaries that extend far beyond traditional corporate perimeters to encompass ever-growing (and shifting) customer and business communities, as well as a growing base of smart, interconnected "things."

Business and IT leaders driving their organizations' DX efforts must ask three questions:

- Are our existing datacenters up to these new demands on infrastructure and data management systems when it comes to capacity, flexibility, and operational cost?
- Are our datacenters in the right locations to deliver the right data to the right people and the right location while meeting performance, reliability, and data sovereignty requirements?
- How can we ensure that we have access to new datacenter capacity to meet geographic and service expansion in days or weeks, not the years it takes to build new datacenter facilities?

Organizations increasingly recognize that their internally owned and operated datacenters are often in the wrong locations and that the traditional IT architectures within them are not capable of keeping up with new demands. These core back-office applications are being asked to contribute key data underpinning new 3rd Platform-based services, and this functional extension is placing growing pressure on IT systems in terms of performance, agility, and operational efficiency. The demands of data and its strategic importance in digital business require that data be placed closer to where it's consumed. This data placement should be done in real time with a secure interconnection.

THE INTERCONNECTED, DATA-DRIVEN ENTERPRISE IN 2018

IDC believes that during the next three to five years, enterprises will commit to massive investments in digital transformation and the 3rd Platform while also adopting a fundamentally different approach to datacenter ownership and operations — all in a bid to stake out leadership positions in what is being called the DX economy.

Internet of Things Drives Data and Compute Expansion

One major change is a redefinition of the network edge driven by mobility and the Internet of Things (IoT). Enterprises lacking an IoT strategy and next-generation infrastructure will be at a significant disadvantage.

Organizations need to start investing now in datacenter facilities where they can collect, organize, distribute, process (in real time), and archive this rapidly expanding pool of data in new systems of record and from myriad external data sources. These facilities must be in locations with access to virtually all carrier networks as their devices are spread around the globe.

By 2018, as the number of IoT devices more than doubles, more than 200,000 new apps and solutions will be developed to take advantage of this data explosion, improving the relevance and timeliness of business data. IDC predicts that by 2018, more than half of developer teams will embed cognitive services into their applications. Delivering real-time cognitive insights will be a standard part of many solutions, driving unprecedented productivity gains and innovation.

The new compute-intensive analytics and cognitive systems of insight will need to reside near the data, so organizations need these same datacenter facilities to realize cost optimization (space, power, cooling) as well as quick access to more space (in the same datacenter and in datacenters in other regions) as the use of advanced analytics grows.

DevOps and the Data-Driven Enterprise

The data deluge will intensify on other fronts too. By 2018, enterprises with DX strategies will expand use of external data sources by at least three- to fivefold and delivery of data to the market by 100-fold or more. In the DX economy, innovation = code + data. Without access to large volumes of quality data "fueling" innovation, the process stalls.

As a result, enterprises must prioritize the supply of data to their developers and digital innovators. The ability of an enterprise to compete in the DX economy will depend greatly on its ability to build robust "data depots and warehouses" for the collection of data and "data pipelines" movement of data into and out of its organization. In 2016, and for the next several years, enterprises must focus on developing a data-driven datacenter strategy that accommodates expanded and faster access to external data sources that enhance understanding of marketplaces and internal data sources that deliver value to those marketplaces. Competitive advantage will come down to "time to insight," which will ultimately require localizing data at the edge in order to minimize latency for real-time analytics.

IT organizations need to expand their use of datacenters that reduce the cost and complexity of data exchange. The right datacenter partner can help:

- Accelerate data capture, aggregation, cleansing, analysis, and distribution optimized for speed analysis, data control, and operational excellence
- Enable dynamic workflows across internal and external business ecosystems that drive the enrichment of data through intelligent comingling of internal and external data sets

- Improve business agility and flexibility as winners quickly gain competitive advantage over those that lag behind
- Optimize low-latency transaction processing, data transfers, and data delivery to support the extension of existing applications into new systems engagement and insight

The right partner can also address one of the major barriers to becoming a data-driven enterprise: data sovereignty. The increasingly complex range of data movement and access rules around the globe make it difficult, if not impossible, for organizations to use their own centralized datacenters to store and analyze data on all their customers. A datacenter facilities provider with global presence and robust datacenter interconnectivity can speed business expansion while reducing the business risks associated with data compliance and security.

EQUINIX'S DATA HUB SOLUTION: MAXIMIZING THE VALUE OF DATA IN THE INTERCONNECTED ENTERPRISE

Equinix is a leading provider of carrier-neutral datacenter facilities and datacenter interconnection services around the globe. Its mission is to power and protect all digital business by providing interconnection-dense, high-performance, secure datacenters and 99.9999% uptime, where customers can access direct, private, secure, and scalable connectivity to cloud providers and business ecosystems

Equinix operates 145+ International Business Exchange (IBX) datacenters on 5 continents, offers software-defined interconnection services that enable rapid data movement and sharing, and provides a broad portfolio of professional services to simplify customer datacenter operations while maintaining control globally. These components are packaged together in what is called Platform Equinix. Platform Equinix has the building blocks needed to provide the global reach and scalability, network choice, ecosystem access, and flexibility required in the 3rd Platform world.

In response to customers' need to meet the challenges of the 3rd Platform world, Equinix has organized its solutions to align with an Interconnection Oriented Architecture (IOA) – an "interconnection first" approach to leveraging datacenter placement and operation. IOA is a transformative approach to the way information technology connects the enterprise. When properly implemented, IOA enables enterprises to adaptively address the key challenges of digital transformation:

- **Interconnecting people:** Linking customers, employees, and partners with a responsive and high-quality digital user experience
- **Interconnecting locations:** Delivering network scalability and global market access with a choice of over 1,100 network providers so one can deploy quickly as the business scales
- **Interconnecting clouds:** Leveraging the services of cloud and managed IT services providers (more than 1,200), globally, to simplify and rationalize resources while focusing on innovation
- **Interconnecting data:** Exchanging data with partner ecosystems and locating data and associated analytics systems in proximity to where one's business and customers are

Platform Equinix solutions include the following key architectural components (see Figure 1):

- **Performance Hub:** In an IOA, Performance Hub fulfills the communication hub functions. Established inside one of Equinix's IBX datacenters, it enables:

  - **The private extension of the enterprise network:** To new markets and locations with cost-effective network ecosystem options, optimizing throughput and latency for the best quality of experience (QoE)

  - **The enterprise to rewire its topology:** As business requirements change, forming a secure mesh that can continually change and scale as traffic and business shifts

  - **The integration of many-to-many localized connections:** Acting as a secure intersection point for business and services to meet (and cross-connect)

- **Equinix Cloud Exchange:** This switched fabric enables an enterprise to create multiple secure, high-performance connections to cloud services through a single port. Available in 21 markets globally, Equinix Cloud Exchange provides:

  - A simplified process for provisioning and managing connections to multiple public cloud services through a restful API, software-defined orchestration layer

  - Access to a diverse cloud ecosystem, including Amazon Web Services, Microsoft Azure and Office 365, Google Cloud Platform, IBM SoftLayer, and Oracle Cloud

  - Delivery of an efficient, secure, and highly available cloud service from applications residing in an Equinix Performance Hub

  - A platform for secure and reliable data collection, management, and analytics services deployed in an Equinix Data Hub

- **Data Hub:** An extension of the Equinix Performance Hub framework, Data Hub provides an agile, cost-effective, and interconnected datacenter compute and storage solution to address organizations' growing demand for scalable data collection and data protection along with increased use of real-time analytics and IoT-based applications. It plays a key role in helping customers more effectively leverage the datacenter facilities needed to build 3rd Platform applications and run a data-driven business. Use of Data Hub enables:

  - Delivery of the facilities that customers can use to build a globally optimized data platform located in strategic datacenters while still adhering to domestic and foreign compliance regulations

  - Assurance of the maximum level of geographic choice, with Data Hub facilities located in 40 of the world's top business markets

  - Full control of business-critical data as well as quick access to important third-party data while meeting security and compliance demands

  - Access to a rich ecosystem of peers who can share supplemental data, as well as interconnection opportunities to the leading cloud data analytics service providers, allowing for efficient data enrichment to drive high-quality insights

The result is that customers can strategically locate data where it's needed most and easily plan for future growth while minimizing performance, data sovereignty, or cost challenges.

FIGURE 1

Platform Equinix Solutions
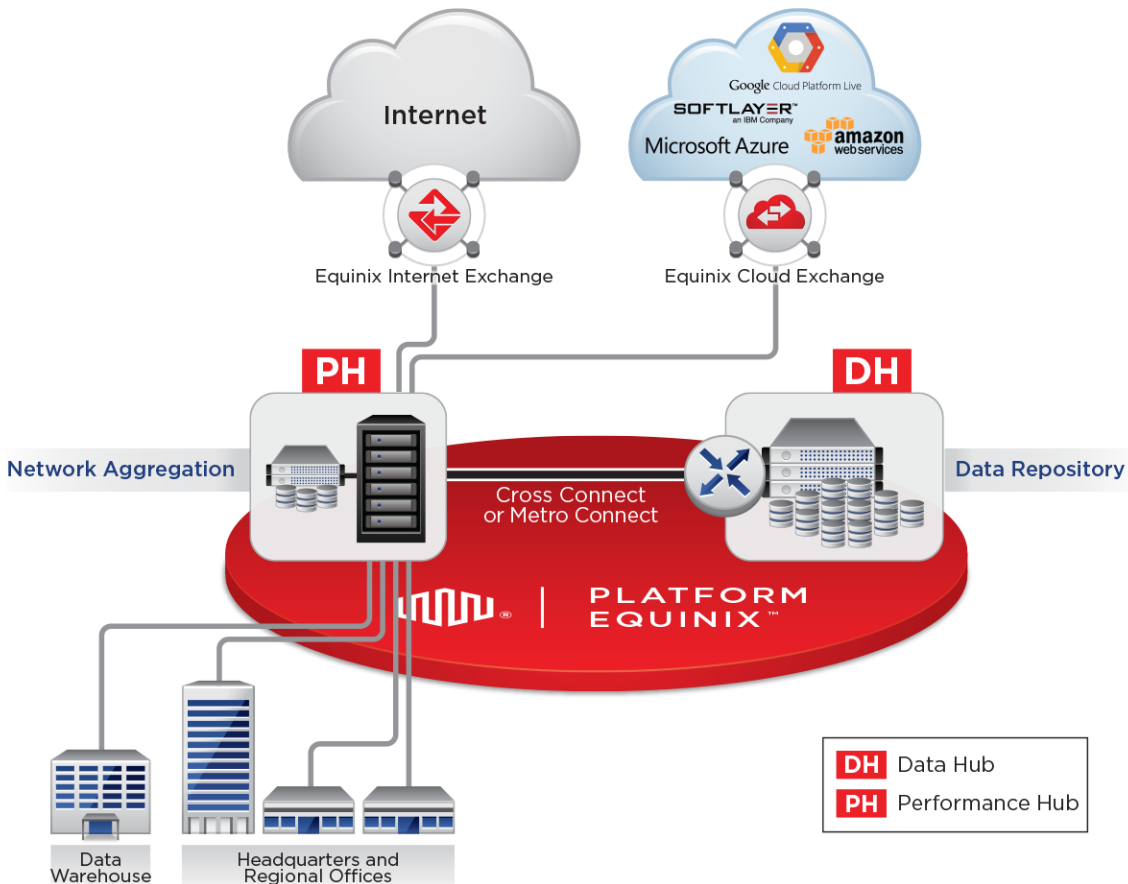
Source: Equinix, 2016

Challenges/Opportunities for Equinix

The primary challenges for Equinix when it comes to delivering on its Data Hub offering will focus on issues related to data.

For organizations seeking to use Data Hub to relocate existing applications and data assets in order to optimize costs and guarantee performance in support of cloud-based extensions, the challenge is enabling a rapid and cost-effective migration of data and IT assets into the Equinix facilities. Equinix must ensure that it has a strong portfolio of cloud service providers with data and system migration skills available to ease and accelerate participation in its Cloud Exchange.

For organizations planning to use Data Hub as the repository and compute pool underpinning IoT and other types of digital services, the key challenge is establishing and maintaining strong data control practices. Equinix will need to provide simple access to a broad array of technology and service partners that can provide solutions for controlling data movement, organization, security, and use.

ESSENTIAL GUIDANCE

In this era of digital transformation and the shift to 3rd Platform IT, the datacenters running an organization's mission-critical business processes, applications, and supply chains must move closer to the edge, nearer to the customers. A key consequence of this evolution is the growing interdependency of business models. Doing business in the digital economy requires secure interconnection among dispersed ecosystems of employees, partners, and suppliers as well as internal back-end IT systems that supply valuable information used to build new services.

The digital economy also makes it easier (necessary) for enterprises to pursue multiregional or global market opportunities. The IT architecture underpinning 3rd Platform-based business initiatives must be distributed, interconnected, and secure in order to serve more customers in more places and to support "just in time" communities of business value that extend across countries and regions.

Now that more enterprises are moving beyond the experimentation phase with regard to their use of 3rd Platform technologies, there is a greater need to integrate various IT components across and between companies into unified innovation-enabling platforms that ensure workload/application, service delivery and availability, scale, speed, choice, and security.

3rd Platform IT is not just about the adoption of specific technologies such as servers, storage, datacenter networks, software-defined infrastructure, middleware, and applications. It's also about making sure that all these datacenter assets are tied together — interconnected — into an adaptable, technology-enabled business fabric that operates securely and efficiently and can adapt on demand as dictated by business and market requirements. Enterprises just starting out on the digital transformation journey should adopt an "interconnection first" approach to ensure that the people, locations, clouds, and data can extend out to the edge where the customers and device endpoints are and back to the distributed datacenter cores ("the cloud") where the big IT processing, storage, and integration hubs are.

Digital transformation requires 3rd Platform IT *and* interconnection-oriented architectures. Access to an optimized environment that supports 3rd Platform-driven innovation, new business models, and multiorganizational business flows and value creation is critical. Your organization needs a datacenter partner that can support digital economy aggregation and organization. It must provide a critical mass of ecosystem partners, suppliers, and customers interconnected in colocated datacenter facilities across the globe.

Equinix, with 145+ datacenters in 40 metropolitan business/financial centers worldwide and an interconnection-first approach to IT, offers the type of platform needed to create a flexible datacenter environment for innovation, integration, codevelopment, aggregation, and distribution. By providing optimized performance via low-latency physical connectivity as well as flexibility in construction and reconstruction of business workflows, Equinix can assist your organization in improving operational efficiency, targeting new opportunities, and continually improving the customer experience at the core of digital transformation.

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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