Native Digital Supply Chain Optimization Data Centers Fuel IT Modernization





Apple is famous for bringing to market products that create fiercely loyal brand advocates. Since its inception, Apple has focused on creating a customer experience (CX) that makes cutting-edge, disruptive technology accessible and valuable to anyone. Over the years, they developed a model digital ecosystem of interconnected products and built a digital community that thrives on Apple's inimitable CX. What's the lesson here? Apple's ecosystem proved to be a remarkable competitive advantage:

Apple was the first publicly traded U.S. company to reach a market valuation of

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Native Digital Supply Chain Optimization



The idea of a digital ecosystem is evolving. Instead of a single enterprise creating a sphere of products and services designed around customer preferences, digital ecosystems are beginning to form, interconnected by a "native digital supply chain."

Let's unpack native digital supply chain. We are not talking about the tracking of physical goods, or even the digitization of traditional supply chain logistics. Instead, we are looking at the data shared amongst all stakeholders in digital ecosystems and passed by workloads deployed on-premises, in third-party data centers and clouds, and at the edge. In a digital ecosystem with a native digital supply chain, data is the asset, and a very powerful asset at that.

Digital transformation took a big step during the past 18 months, when a cataclysmic event proved what Apple (and others, to be fair) recognized – CX has a huge impact on success. In a recent poll, 451 Research® observed, "for digitally demanding consumers, the ideal CX is a simple, easy to use, efficient web experience, ahead of lowest prices and innovative products and services."² When CX is so powerful that it influences buying decisions on par or better with price and innovation, enterprises of all sizes need to take notice and take action.



That's just one advantage.

Interconnection can help enterprises reach other objectives, including:

Future-proofing by preparing for multiple possible futures with IT modernization

Making better decisions and judgments based on data culled from the digital ecosystem and leveraging data science including artificial intelligence (AI) and data literacy³

Increasing revenue opportunities by speeding time to market, cultivating digital ecosystem growth and expanding market reach

Native Digital Supply Chain Optimization



In this white paper, we will explore how data centers help forge and optimize a native digital supply chain and drive IT modernization, enabling enterprises to reach key business objectives, with a focus on:

The competitive advantages and value that interconnection within digital communities and digital ecosystems creates

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Inherent challenges to transforming into a digital-first business



Solutions including colocation, cloud and network connectivity, as well as other enabling data center technologies

Future-Proof with Modernized IT

In nature, ecosystems are communities of organisms that interact within a shared environment – the people in cities and neighborhoods, the marine life in oceans and tide pools. In digital ecosystems, enterprises, business partners, service providers and customers interact in multicloud and hybrid cloud environments. The size of those ecosystems varies and, ideally, dynamically scales relevant to expected, unexpected and envisioned business requirements.

"Survival of the fittest" applies in both worlds. The Federal Reserve estimated that 200,000 more businesses closed than normal (approx. 600,000) in 2020 due to the pandemic.⁴ A type of natural selection occurred; enterprises unable to transform into digital-first businesses are now extinct.



Why did others survive and, in some cases, thrive? Accenture recently reported that technology adoption leaders experienced <u>two times revenue growth</u> compared to digital transformation laggards.⁵

The ability to leverage digital ecosystems is one part of the answer. Thanks to being further along on their transformation journey, those enterprises were able to rapidly implement remote work strategies and (for many) digital-only customer interactions. They were prepared to adopt the "third wave" of cloud computing, enabling IT modernization and for ecosystem members to "do business."

To understand the third wave of cloud computing, it's important to look back on the first two waves and the evolution of digital communities.



FIGURE 1: Technology adoption leads to two times revenue growth compared to laggards⁵



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Carriers Ride the First Wave

The first wave of cloud and colocation adoption crested between 2000 and 2010, when network carriers recognized that network peering within carrier-neutral data centers could engender a digital community. At the same time, enterprises were experimenting with the cloud, primarily using it as a development environment. They were in the midst of taking a cloud-first approach to processes to improve productivity and reduce costs, for example by implementing software-as-a-service (SaaS) solutions such as Salesforce or PeopleSoft.

Large Enterprise Gets on the Second Wave

The second wave, circa 2010-2020, was driven by large enterprises with very large networks. They saw the advantages of cloud applications and that network carriers had the infrastructure to move data within the growing digital communities. Carriers enabled direct, private connections across vast enterprise networks; data centers provided low-latency cross connects tethering business partners; and native onramp connections to cloud service providers became part of multi-cloud architectures. Application development became a competitive differentiator. Companies also began moving workloads around from one cloud to another as unexpected costs and security issues cropped up, and more public cloud provider options became available. Smaller businesses began to tap into cloud services, as the business case for doing so became positive.

Hybrid IT and the Third Wave

That brings us to the third wave of cloud adoption, in which companies are no longer new to the cloud and are using multiple clouds and network services to "build digital experiences to connect and engage with customers, employees and partners."6

Elevated rethinking of workload distribution is part of the third wave, facilitated by platforms giving IT teams the ease-of-use and agility to deploy, move, enhance or eliminate workloads to yield the most value. Colocation adoption is also a piece of the strategy. Third-party data centers offer the control of an onpremises facility, but with superior network density, reduced maintenance burden, simplified compliance and higher security. We'll elaborate more on the services and value for colocation later.



CoreSite also is seeing more small- and medium-sized businesses (SMBs) make the transition to a digital-first business model, catching up with large enterprises and becoming more likely to be part of the digital supply chain. Service providers (offering SaaS, Internet as a Service, Platform as a Service, etc.) are also experiencing benefits, thanks to direct access to clouds and networks and the speed and simplicity of interconnecting to enterprises colocated within data centers.

SMBs can leverage AI as a service (AlaaS) to build "custom chat bots for their website or automate a process without much (if any) real-world programming experience. These types of tools will be key to enabling smaller companies to consume the benefits of AI."7

So, how does all this relate to the three core objectives set at the top of this discussion?

- The synergy generated by digital ecosystems and third wave of cloud adoption gives businesses the power to prepare for multiple possible futures. With an interconnected digital community and the ability to relatively easily move workloads, pivoting in response to changing business conditions is less disruptive.
- The immense volume of data produced across the native digital supply chain, when effectively analyzed, can be a powerful brand differentiator.
- As the universe of members within a digital community expands, the volume of revenue opportunities grows as well; customers of each member are potential new customers for other members, and the beauty is that those customers welcome the "frictionless" experiences.

Improve Decisions with Truly Actionable Data

Companies have long been unable to fully understand evolving customer preferences; not for lack of trying, just ask any marketing professional. In the past, what enterprises could do was improve core competencies by leveraging software and increasingly more powerful network technologies to boost productivity and simplify processes. A given enterprise could differentiate by being better at what they did than their competitors, and point to increased revenue to gauge the quality of processes, products or services. However, data sharing still was confined to the enterprise network. And "data mining," the cutting-edge data analysis practice (and a step in the right direction) only enabled identifying broad patterns of customer behavior and preferences.

IT modernization finally makes true CX insight possible.

The data generated enables understanding customer preferences so quickly and accurately that customers are also business partners in a way, constantly measuring and informing process decisions through their actions, which has always been the data analysis endgame.

For example, by implementing a private cloud edge point of presence (PoP) at the ecosystem edge, immediate interpretation of a customer's digital behavior empowers business-specific algorithms to make "decisions" that result in, for example, if-you-like-that-you-will-probably-like-this recommendations. In B2B relationships, supply chain digitization (not to be confused with the native digital supply chain theme central to this discussion) enables optimizing logistics; Aldriven network control instantly reroutes network traffic to ensure consistent application performance, or to dynamically adjust bandwidth consumption and control network costs. Data generated anywhere in the native digital supply chain – including at the edge, where customers are – can be transformed into actionable information. This is where data literacy comes into the IT modernization picture. "As AI becomes a more critical component of business, modern professionals have a growing need to understand how to challenge the outputs of algorithms, and not just assume system decisions are always right," says the Harvard Review.⁸ What is important about data literacy is how it complements AI-driven data analysis in decision-making. The ability for people to read, work with, analyze and argue with data brings context and intuition into the decision.

The combination creates a powerful mechanism for producing data that has the accuracy, quality, ubiquity and accessibility to be deemed truly actionable, valuable information one can use to make both highly specific and broad operational decisions with confidence.



Tackle Unpredictability and Other Challenges

The desire to be a "digital-first" enterprise has supplanted being "cloud-first." In a previous CoreSite white paper, <u>Solving</u>. <u>IT Modernization Challenges with Hybrid IT</u>, we discuss some cloud-first shortcomings, including inflated data transfer costs and the inability to predict data volume usage.

Also, keep in mind that most cloud-first initiatives do not result in full digital transformation, the state needed to execute optimized hybrid IT. In 2019, the Harvard Business Review reported that 70 percent of all digital transformation initiatives do not reach their goals.¹⁰

In the past, it was easier to predict when you would need to scale up network or cloud capacity. For example, even only a few years ago if a company was going to roll out a major software update, they could plan networking requirements around the release schedule.



FIGURE 2: Most cloud-first initiatives do not result in full digital transformation¹⁰

The impact of the COVID-19 pandemic has altered how we work, conduct business and consume. A McKinsey survey published in October 2020 found that companies are three times likelier than they were before the crisis to conduct at least 80 percent of their customer interactions digitally.¹¹

What business witnessed in 2020 is that it's essential to be able to scale bandwidth and burst into the cloud on-demand, and that revenue is dependent on network uptime more than ever. It is clear now that planning for multiple possible futures is mission-critical. However, making sweeping changes to deeply ingrained processes – whether that means transforming infrastructure or how business happens on a day-to-day basis – is complex, risky and perhaps disruptive.

A "digital culture" is one that enables rapid adaptation and innovation in fast-changing technological and competitive environments.¹²



FIGURE 3: The COVID-19 pandemic has altered how we work, conduct business and consume¹¹

Let's look at a few of the challenges organizations are up against and how colocation in data centers can solve them. Of course, the examples here are far from a comprehensive accounting of the barriers and remedies colocation offers. However, there are many reasons to be confident that current technologies and innovations can overcome the obstacles, including security and reducing total cost of operation.

Торіс	Challenge	Data Center Advantage
Knowledge Gap	Most enterprise IT teams typically have experience integrating networks to other networks. Broad (potentially global) wide area networks call for design and multicloud management skills related to colocation and making myriad private connections.	Engaging an expert with the experience and resources to lonly accelerates digital-first transformation and ecosystem enterprise teams to focus on innovation and core processe infrastructure.
Equipment	Enterprises rightfully have not invested in the routers capable of supporting network-to-network communication at the scale required to interconnect with a digital ecosystem.	Locating high-performance, automated routers in colocati and value from the investment because a network-dense f traffic moving through the device than if it were in an on-p bang for the buck.
Culture Shift	Declaring that the organization will be digital-first and launching digital transformation projects doesn't magically make it happen. The cultural point of view needs to rotate 180 degrees, making it outside-in and customer-centric. Business decisions need to be made using data analysis and literacy and by asking, "Why will this product, solution or process change matter to customers?"	Data centers offer an environment in which to innovate, fa developers can leverage interconnection to public cloud se horsepower when needed, fostering innovation. Over time, first mindset are proven, the culture shifts. According to th 79% of companies that focused on culture as part of their of sustained strong or breakthrough financial performance. ¹³
On-Premises Data Center Operation	Organizations choosing not to engage third-party data center providers need to anticipate the exponentially rising data, workload and networking demands they will face. Increased need for space, power and cooling should be factored into the business case when deciding to build-out an on-premises data center.	One of the most compelling reasons to include colocation data center handles all the power and cooling, and each cu requirements and increase the footprint to racks, cages, su when needed.
Security	Maintaining the physical security of an on-premises data center calls for dedicating internal resources to both routine maintenance and unexpected threats. Cybersecurity is half the battle.	Both process controls and technical controls are rolled into procedures. That includes end-point protection, least privi network segregation. Furthermore, data center providers p that most enterprises can't match. Enterprise IT teams del concentrate on continually improving the services or proce unique and competitive.
Digital Ecosystem Interconnection	Enterprises of all sizes are making the transition to a digital-first business model. In turn, digital ecosystems in public clouds are expanding, offering revenue growth opportunities — if the enterprise can cost-effectively connect with business partners.	Select data center providers that have direct access to clo data egress fee reduction and secure, low-latency intercor business partners, and other service providers.

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ation data centers elevates ROI e facility inherently results in more -premises cabinet. You get more

fail fast and learn. Application services and compute ne, as the advantages of a digitalthe Boston Consulting Group, r digital transformation initiatives

n in the infrastructure is that the customer can design for current suites or even entire floors if/

to colocation operational vileges, threat monitoring and provide a level of access control eliver more value when they can cesses that make the business

cloud, which enables significant connection to hybrid applications,

Use Data Centers as Your Intersection of Interconnection

Data centers are the focal point for interconnection – which allows private, secure, low-latency, direct exchange of data between enterprises and clouds. Data centers are ideal interconnection environments for several reasons, including:

Ecosystem Density

When multiple entities have deployed in a data center, physical connections (cross connects), ethernet virtual circuits (virtual connects) and software-defined networking facilitate oneto-one and one-to-many data exchange. The value of density in regard to CX is the ability to create automated, personalized and frictionless experiences. Furthermore, as McKinsey Digital remarks, "Most global companies are now actively considering the ecosystem business model given its value-generation potential: growing the core business, expanding the network and portfolio, and generating revenues from new products and services."9

Proximity

Distance equals latency. Reducing the distance between ecosystem members by colocating in the same facility or data center campus is a simple solution for minimizing latency. Cloud adjacency provides low-latency, private connection to public cloud. Cost is reduced as well, because long-haul network fees are eliminated.

Two types of direct connections are relevant to colocation. First, private physical and virtual connections between ecosystem members, which are the most secure and lowest latency, as mentioned. Second, direct connections to major cloud providers (CSPs), which facilitate high performance utilization of cloud services and drastically reduce data egress fees.

Direct Connections



Enable Native Digital Supply Chains

How do you future-proof a business? Become a digital-first enterprise and achieve desired outcomes around CX, competitive advantage and revenue growth?

We believe the answer to that lies in IT modernization and optimizing your native digital supply chain. What do we mean by "optimizing your native digital supply chain?"

At the top of this discussion, we said that in a native digital supply chain, data (the "goods") is shared amongst stakeholders in digital ecosystems and passed by workloads deployed on-premises, in third-party data centers and clouds, and at the edge (often where the goods are "consumed"). Now, let's look at how that can be executed in three different industries.

Media and Entertainment

Movie and television production today involves multiple entities with each having a place in the workflow. On any given day, the data generated during "filming" is passed via a network to studios that specialize in the post-production services, everything from editing the raw footage to stitching together the narrative, to adding visual special effects (CGI, computer generated effects), the soundtrack and asset storage, transcoding and rendering. The supply chain links creative teams, producers and video pipeline managers who need to quickly access and pivot between services in the workflow.

In media and entertainment, time is money.

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A twist in this digital supply chain example is that competitors (businesses that offer identical suites of services but are chosen to provide one service while a competitor is engaged for another) collaborate as "frenemies," temporarily allowing access to their private networks and clouds to exchange the data. Remote collaboration, across town or across continents, often needs to happen in real time.

Once all the post-production tasks are completed, the finished product is the property of Disney or HBO, for example, and then distributed in one way or another until it is seen by you and me, the end of this supply chain.



Areas of the digital supply chain that need to be optimized include:

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Entities in the workflow transfer extremely large files to one another and to and from clouds. It's possible to do this via the public internet, but costly, unreliable and vulnerable. A data center can offer a private network connection with the bandwidth to handle extremely heavy files, "always-on" redundancy, resilience and high security. If the data center provider has direct connection to major clouds (like CoreSite does), data egress costs may be drastically reduced.



Interconnections between partners and services need to be quickly switched on and off. Cross connects provide rapidly established, highly secure interconnections between companies within the data center. Exchange platforms, such as CoreSite's Open Cloud Exchange[®], provide a self-service tool enabling virtualized networking and a direct connection to clouds and services.



Streaming to the audience means that eventually the public internet is an element in the supply chain. Data center providers can enable more strategic peering locations on the network to ensure best possible routing and customer experience.

Online Fitness

NordicTrack, Peloton, Apple and many other enterprises stream live and ondemand virtual workouts to millions of treadmills and home workout areas each month. In 2021, the global online fitness industry was valued at \$10.71 billion.¹⁴ Customer experience is obviously critical to winning and retaining subscribers, especially as some customers return to the gym.¹⁵

A critical section in the supply chain is the connection between content (workouts) stored in public and private clouds and all those stay-at-home workout enthusiasts. Providers need to manage their hybrid cloud environment and multiple networks so that mid-routine buffering doesn't interrupt the content delivery and degrade the experience.

Data center campuses located close to dense user populations is one key to ensuring a positive, "sticky" experience. Proximity results in low-latency streaming and, in data centers with extensive network connection options, content distribution is optimized through peering.

As an aside, a library of content – which ranges from virtual one-on-one sessions with a personal coach to routines set in exotic locations around the globe – needs to be developed and kept fresh. That brings the same type of production process we just described in the media and entertainment use case into the picture for online fitness businesses.



Artificial Intelligence

Let's imagine that a contact center provider wants to analyze tech support calls to determine, for one of their clients, which product features were frustrating for users. The contact center company engages an AI services provider that is leveraging the Google Cloud ML Platform, specifically, the natural language analysis tool in the AI Hub. The AI services provider extracts data in the form of call transcripts and applies natural language processing (NLP) sentiment analysis algorithms in the Google Cloud to find moments in the conversation where negative remarks are made and then filters the results to focus on the specific feature being analyzed.

But what if the AI service needs to happen in real time, for example during the interaction/conversation? Chatbots use AI (machine learning and NLP) to respond to common requests and route calls to the personnel trained on a given subject. The decision is made by an AI application in the cloud, and unless the service provider had direct access (as opposed to public internet) the connection may be slow and unstable – jeopardizing the customer relationship.



Take the Next Step to IT Modernization

The time is right for the value of digital ecosystems to be realized by enterprises and service providers (offering cloud, network, content and IT-relevant solutions) within digital communities. With connections and interactions that were not possible before, businesses can expand market reach and service providers can seize new opportunities. 451 Research[®] survey results support that assertion, saying: "For brands and businesses to differentiate and ultimately tap into significant revenue opportunity, they need to implement digital experiences that reduce friction, are intuitive and personalized and adhere to consumers' preferences. Our survey findings, coupled with our Global Unified Commerce Forecast, track an accumulative potential revenue opportunity in the U.S. of at least \$107bn for brands and merchants."²

Enterprises of all sizes are realizing that colocation can be their home for hybrid IT.¹⁶ Densely networked data centers interconnect

the mix of hybrid IT components: on-premises IT, cloud (private, public, hybrid and/or multicloud) and edge.

Physical and virtual cross connects complemented by physical and virtualized WAN routers enable low latency data transfer – fueling AI, data analytics, mobility and 5G. Exchange platforms sit on top of the IT services stack, simplifying network management, workload distribution and dynamic scaling in clouds.

CoreSite is focused on powering our customers' IT modernization and optimizing native digital supply chains that unite trusted and connectivity-rich data communities. As a consultative partner, we can help you build a future-proof IT solution with the agility, flexibility, security and connectivity to ensure your competitive edge and help build a more collaborative world.



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About the Author

Matt Senderhauf

Vice President of Interconnection Strategy

Matt is VP of Interconnection Strategy at CoreSite and has more than 13 years of customer-focused product experience in the networking, data center and telecommunications industries.

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