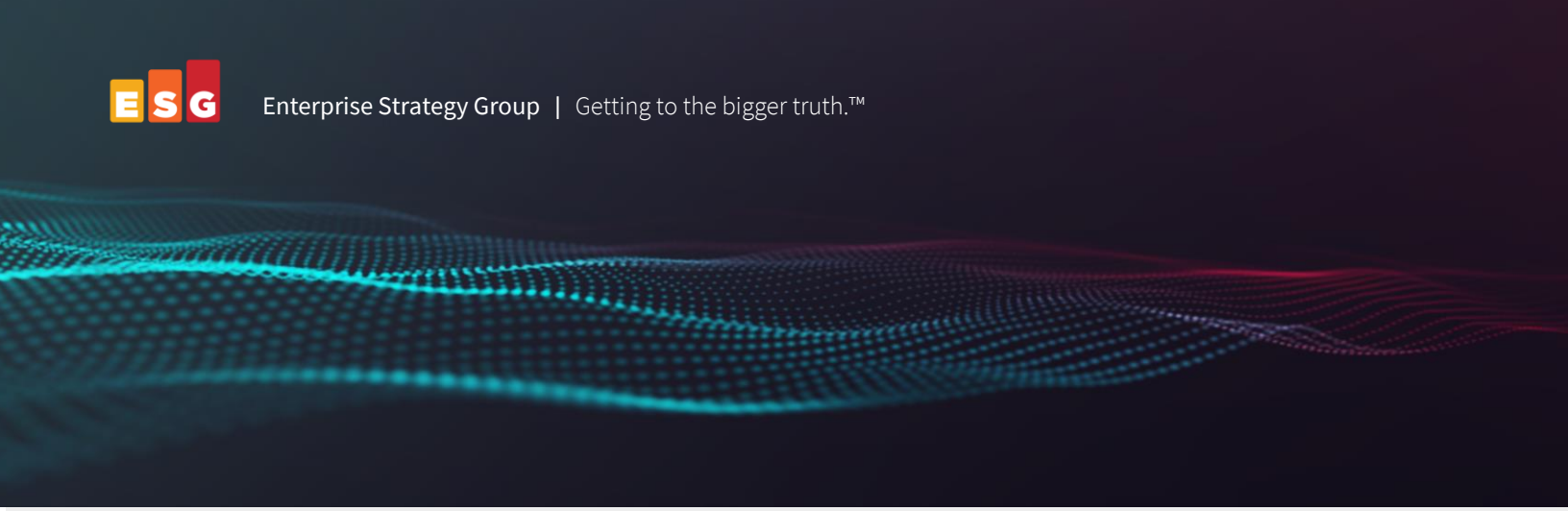

ESG WHITE PAPER

Interconnection Amplifies the Value of Bare Metal Deployments

Optimizing High-performance Compute and Scalability with Equinix

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Getting Digital Transformation Right Is Not Easy

Most organizations are involved in and have likely accelerated some form of digital transformation (DX) to help them innovate and navigate a fluid landscape defined largely by technology advancements, global marketplace conditions, and customer expectations for getting everything fast. A financial institution, for example, may have put in place the infrastructure and systems that enable mobile banking so customers can complete transactions conveniently from wherever they are instead of driving to a bank or ATM.

To help them move from traditional to digital infrastructures, many businesses take a hybrid cloud approach, connecting a mix of public cloud, private cloud, and on-premises infrastructure. Public cloud services, an aspect of DX that has steadily gained momentum, are now used by 94% of survey respondents, according to ESG research.[1] In a separate ESG research report, 76% of surveyed organizations reported being committed to hybrid cloud as a long-term strategy and in various stages of technology evaluation, planning, and implementation.[2]

A hybrid cloud approach can support scenarios including cloud migration, dynamic workloads, development acceleration, containerized workloads, and portability across multiple cloud platforms. In a global arena, these and other scenarios require more compute power, rapid provisioning, low latency, and ideally, predictability and decreased complexity.

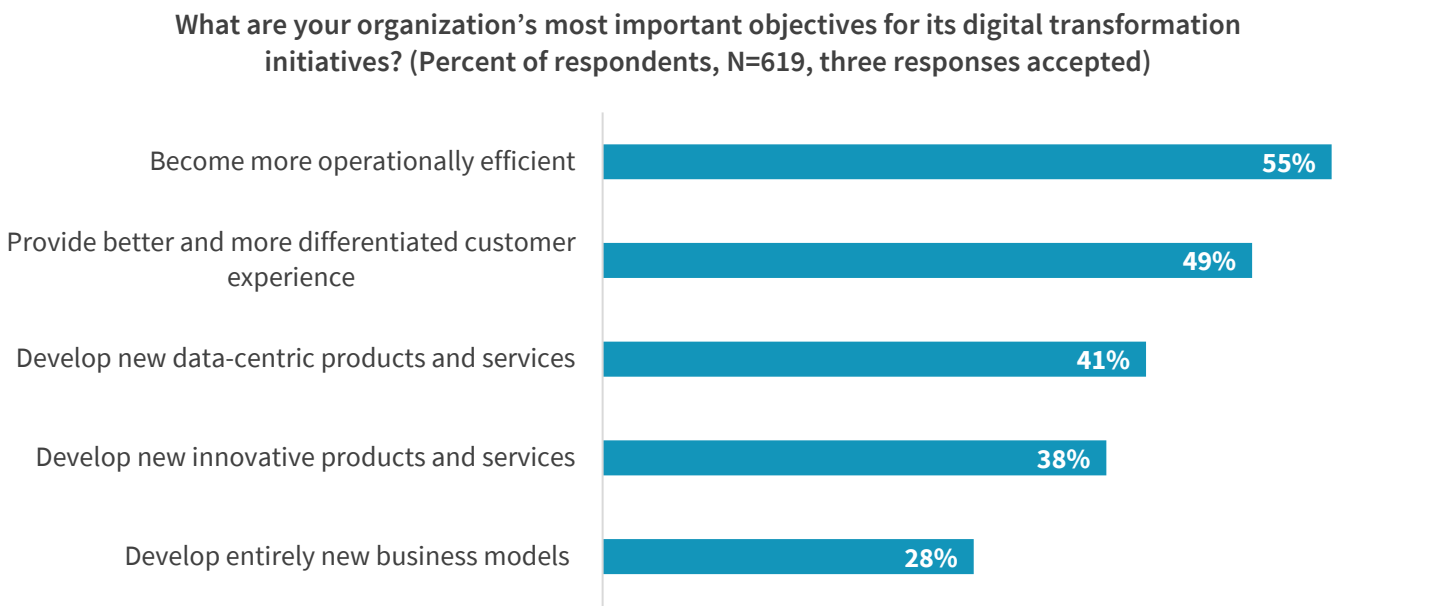
As companies invest in their digital transformations, their infrastructure consumption is becoming more on-demand, global, and interconnected. Furthermore, many digital leaders are looking for an automated path to hybrid multi-cloud architecture. Achieving this dynamic state and transforming in a way that makes the DX journey as simple as possible translates into competitive advantage and greater business agility.

Top Digital Transformation Challenges

Enterprises, network service providers (NSPs), and SaaS companies have different DX timelines and priorities, of course. ESG research respondents identified their leading objectives for digital transformation, and operational efficiency and customer experience were the most common responses (see Figure 1).[3] Operational efficiency improves both internal and external outcomes. For example, faster, repeatable workflows reduce staff time spent on mundane tasks and free workers to focus on new ideas and innovation. Customers benefit from improved efficiency when technology helps them save time or increase convenience. Better customer experience—perhaps in the form of faster service that fulfills their expectations more fully—can have a positive effect on revenue and profits.

[1] Source: ESG Research Report, *2020 Technology Spending Intentions Survey*, February 2020.
[2] Source: ESG Research Report, *Hybrid cloud trends - strategies for optimizing and managing on-premises and public cloud infrastructure*, December 2019.
[3] Source: ESG Research Report, *2020 Technology Spending Intentions Survey*, February 2020.

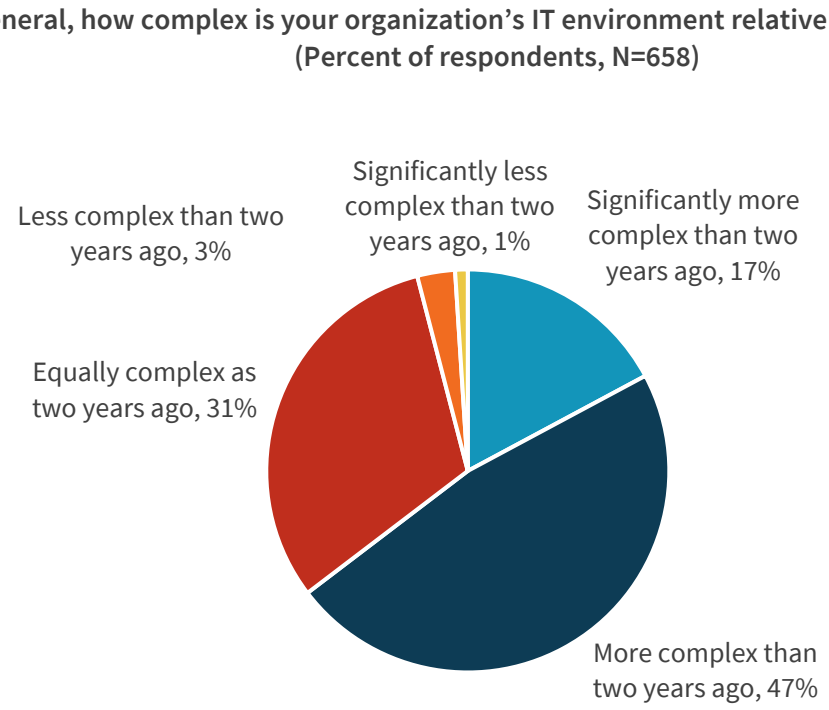
Figure 1. Operational Efficiency and Customer Experience Most Common Objectives for Digital Transformation



Source: Enterprise Strategy Group

However, numerous challenges get in the way of accomplishing DX objectives. One of the most significant is complexity. Nearly two-thirds of organizations say IT is significantly more complex today, and organizations with mature DX initiatives are three times likelier than those with no DX initiatives to say IT is significantly more complex today (see Figure 2).[4]

Figure 2. Digital Transformation Efforts Increase IT Complexity



Source: Enterprise Strategy Group

[4] Ibid.

As organizations move forward with DX efforts, they are balancing these potential barriers:

- Scale—enabling digital business operations rapidly and globally via cloud connectivity and services.
- Performance—supporting real-time transactions with high availability.
- Security—deploying data and security across locations.
- Compliance—enforcing regulatory controls.
- Global reach—removing go-to-market limitations.
- Agility—improving responsiveness to market changes and opportunities.
- Technology integration—adding new technologies to the existing mix while minimizing delays and redundancies.
- Flexible cost structure—choosing advantageous, predictable methods of consumption and payment.

Additional complications include national, local, internal, and external security/compliance requirements, persistent skills shortages, and edge computing requirements. Fortunately, the challenges are solvable.

Bare metal and interconnection, each of which has its own advantages, together enable benefits to be compounded as organizations address DX challenges. Bare metal puts hardware at users' fingertips, providing businesses with access to secure, powerful, agile, high-performance compute. Interconnection allows businesses to directly connect at global scale to their choice of thousands of networking, storage, and compute resources, as well as application service providers.

Benefits of Automated, Interconnected Bare Metal

Increasing operational efficiency and improving customer experience—the top two DX priorities reported in Figure 1—go hand in hand. To accomplish these goals, organizations need high-performance computing and scalability that are easy to consume and easy to budget based on pay-for-use. They also need fast, neutral access to their customers and the networks in which they participate, including major cloud platforms and service providers. And regulated businesses everywhere need to ease compliance efforts. Distributed data placed in regions can help. These requirements can be met by interconnection and bare metal, which together offer a compelling strategy for businesses to digitally integrate and transform. This is where Equinix Metal comes into play.

Use Cases for Secure, Automated, Interconnected Bare Metal

Hybrid Cloud

Reduce CapEx and scale/consume incrementally with a secure infrastructure that is near target ecosystems.

DevOps Automation

Provision rapidly with well-documented APIs and access to ecosystem integrations such as Kubernetes, Red Hat, and Google Anthos.

Global Edge Delivery

Improve end-user experience with lower latency, global reach, and faster time to market.

Security and Compliance

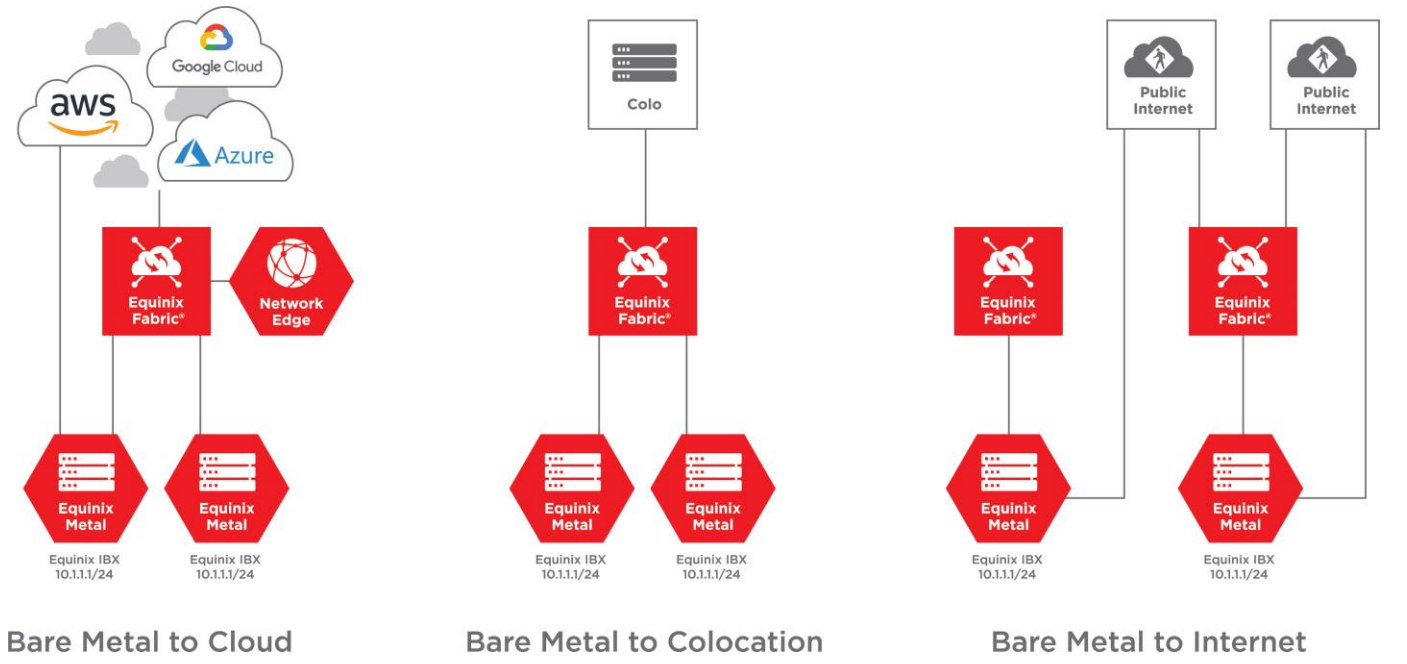
Tighten controls with single tenancy and private connectivity along with access to hardware-level security protocols.

With Equinix Metal, a fully automated and interconnected bare metal service, companies can leverage as-a-service deployment to build foundational infrastructure. This enables organizations to benefit from the global reach, interconnected ecosystems, and trusted partners available on Platform Equinix. As part of the platform, Equinix Metal is integrated with Equinix Fabric, a global, software-defined interconnection service available in more than 45 strategic markets. The integration puts Equinix's ecosystem within immediate reach and provides a path forward for organizations to run their digital businesses efficiently and securely. Automated, interconnected bare metal offers a wide range of advantages, including:

- Automation. Businesses can increase reach and scale quickly. It's possible to automate hardware deployments throughout a global data center footprint and interconnection fabric, and to deploy workloads close to customers, partners, and employees to enhance user experience.
- Security. Dedicated single-tenant infrastructure enables isolation of sensitive workloads and access to hardware-level security protocols. Clouds, networks, partners, and customers are connected securely and privately. Equinix has numerous certifications to simplify security and compliance.
- On-demand, private access to major clouds and services. Equinix customers can connect with more than 1,800 networks, over 2,900 cloud and IT providers, 750+ content and digital media providers, and nearly 3,000 enterprises.
- Agility. Users can deploy hardware infrastructure at software speed, leveraging automated provisioning. DX can be accelerated with native integrations to the Kubernetes/cloud-native ecosystems as well as many hybrid cloud solutions.
- Flexibility. An OpEx-driven digital purchasing model provides consumption choices that can be implemented rapidly.
- Ability to connect anywhere. From one place, organizations can connect employees, customers, partners, and providers. Equinix Internet Exchange and Equinix Fabric provide on-demand connection. Equinix Fabric's software-defined interconnection bypasses the congested internet, providing low latency and reducing the security attack surface.

In distributed hybrid multi-cloud environments, businesses need to connect seamlessly to different clouds, the internet, and their colocation assets. Without interconnection, seamless connectivity to scattered workloads is not easy. With Equinix, organizations can connect bare metal to one or more clouds, bare metal to their colocated assets, or bare metal to the internet. Equinix Metal offers an infrastructure building block on which users can deploy and scale their preferred infrastructure with agility and confidence.

Figure 3. Equinix Bare Metal



Source: Equinix

Equinix Metal empowers Equinix customers to be both creative and practical in solving the DX challenges across verticals. For example, NSPs and SaaS companies face unique challenges that automated, interconnected bare metal can address while also creating opportunities for them to operate more successfully. There are many use cases for IT professionals to consider that might allow them to leverage the benefits of bare metal and interconnection to create a modern application architecture.

Hybrid Cloud Use Case

Organizations are under pressure to innovate quickly. What can help them do this is fast, neutral access to customers and the networks they participate in, including major cloud platforms and service providers, at a low cost. This can be accomplished with a hybrid cloud strategy, which connects a mix of public cloud, private cloud, and on-premises infrastructure to support separate, dynamic workloads; big data processing; cloud migration; containerized workloads; and portability across cloud platforms. Secure, automated, interconnected bare metal delivers infrastructure that is proximate to ecosystems, helps reduce CapEx, and allows for incremental scaling and consumption.

For example, a virtual desktop SaaS provider can use interconnected bare metal to manage its software for a global call center and healthcare provider customers. The provider can deploy a fully dedicated server in under a minute in global locations, shortening time to market via fast connections to partners and customers.

DevOps Automation Use Case

A key differentiator and value driver is the ability to develop and deliver software efficiently and accurately. For this reason, organizations adopt DevOps standardized workflows, processes, technologies, protocols, and metrics. Adoption reduces the variety of associated risks and enhances the potential for automating otherwise manual processes. Automating infrastructure and software deployment fosters faster delivery time, greater accuracy, consistency, and reliability, and increases the number of deliveries.

Automated, interconnected, low-latency bare metal enables organizations to spin up infrastructure and network connections between that infrastructure or from infrastructure to service providers (cloud and network), all via APIs, in minutes. Users can leverage physical machines in the same way as virtual machines to quickly develop and provision new applications.

Global Edge Delivery Use Case

Organizations need to expand their global reach across a unified cloud and edge strategy to take advantage of leading technology to scale quickly without business disruption. They can do this with network-optimized bare metal.

Interconnected bare metal provides a stable, robust infrastructure that increases organizational agility and enables quick deployment to new markets. Companies can place dedicated resources closer to end-users and devices. This frees core architecture and high-value network assets for mission-critical tasks.

Security and Compliance Use Case

Organizations can reduce surface vulnerability with single-tenant infrastructure. With single tenancy, one organization's data is completely isolated from other organizations' data, helping mitigate common security concerns by isolating sensitive workloads. This approach supports compliance needs, especially for payment-related transactions, or in the case of regulations related to data residency.

With globally interconnected bare metal, organizations have greater control over surface vulnerability and gain the security benefits of single-tenant infrastructure. Fully dedicated single tenancy allows organizations to access Intel SGX, AMD SEV, and other hardware-level security protocols.

DX Opportunities for NSPs

NSPs can grow by offering private connectivity to cloud service providers (CSPs), but they are constrained by the resources, cost, and complications involved in individual integrations. In addition to solving this issue, NSPs are focused on:

- Maintaining a high-quality customer experience and loyalty.
- Scaling to support geographic expansion.
- Simplifying how they deploy new and/or expanded offers.

Automated, interconnected bare metal helps keep OpEx low for NSPs that must offer flexible product configurations and operate with low latency, redundancy, scalable bandwidth, and usage-based billing. By integrating their networks and APIs through Equinix, they don't need to integrate individually with CSPs. This reduces complexity and time to market.

DX Opportunities for SaaS Companies

Pre-IPO and IPO SaaS companies already are software- and cloud-enabled, and, while capable of running their own infrastructures, they typically don't. They need a high-performance compute infrastructure with service-level agreements (SLAs) that enables them to react quickly, provides proximity to end-users and partners, and eliminates overspending on infrastructure—all with full control of the entire stack. Armed with these capabilities, SaaS companies can better accomplish their core objectives:

- Reaching and servicing customers faster, better, and less expensively.

- Growing their businesses faster as an alternative to cloud without colocation.
- Establishing a channel for technical innovators/manufacturers to distribute their products.

Automated, interconnected bare metal helps SaaS providers operate closer to users—a performance advantage. Further, by deploying an infrastructure within an Equinix data center, SaaS providers can choose from many communications service providers to optimize cost, network routes, and availability; provision customers rapidly; and integrate APIs. This approach allows SaaS companies to shorten time to market, manage seasonal demand, and increase operational efficiency by reducing the cost of new point-of-purchase deployments.

The Bigger Truth

Many enterprises leverage bare metal for their high-performance compute needs. Computing is moving away from centralized data centers to a distributed infrastructure closer to important edge locations. As interconnection and data exchange between businesses and cloud services grows, this digital infrastructure must be global, interconnected, and agile. The pairing of bare metal and interconnection clearly offers solutions to many common DX obstacles, making the transformation process from traditional to digital infrastructure simpler and faster.

Equinix has grown steadily for years with data centers, colocation, interconnection, and services, as well as a global footprint that spans more than 220 data centers in 26 countries. The Packet acquisition earlier this year augments Equinix's organic bare metal development with developer-oriented bare metal services and the ability to provide highly customized hardware configurations.

Equinix Metal can help digital businesses reduce time to market and reach users with high-performance compute. Organizations can quickly and securely deploy and connect with customers, suppliers, and partners. Companies can automate foundational infrastructure building blocks and interconnect hybrid multi-cloud infrastructures at global scale on Platform Equinix. Bare metal-as-a-service addresses the growing need for physical infrastructure at the edge.

Equinix has really thought through both what's needed and how to deliver it to businesses wanting to enter or expand global digital operations. Regardless of where companies are on their digital transformation journeys, Equinix can most likely smooth out some of the bumps.

To learn more, visit https://metal.equinix.com/.

Enterprise Strategy Group is an IT analyst, research, validation, and strategy firm that provides market intelligence and actionable insight to the global IT community.

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