

The 5 Principles of IT Infrastructure Management:

How IT Leaders Can Become Strategic Business Drivers in a Hybrid Cloud World

Executive Summary

With cloud adoption at 96%, 81% of enterprises working with a multi-cloud strategy, and organizations using, on average, five different clouds ([CIO.com](https://www.cio.com)), it's clear that we live in a hybrid, multi-cloud world.

The industry-wide demand for continuous innovation, the maturing of digital transformation initiatives, and the emergence of DevOps as the de facto development methodology for enterprises of all sizes, have brought us to this point. On the one hand, these trends have resulted in remarkable and rapid advances in technology. On the other hand, they have introduced monumental levels of complexity into the practice of IT infrastructure management.

This complexity is multi-faceted. It involves the management of multiple on-premises, private and public cloud resources, complicated and lengthy provisioning processes for resource deployment, continually evolving challenges maintaining visibility into this ecosystem, as well as perennial concerns around governance, cost control, and security.

In the face of this complexity, enterprise IT is feeling the heat. Charged both with consistently enabling innovation and digital transformation, while simultaneously maintaining visibility, ensuring security and compliance, and through it all keeping cloud spend under control, the pressure on IT leaders is unrelenting and immense.

Unfortunately, IT leaders are falling short, at least from the perspective of the rest of the C-suite. Although IT budgets are on the rise, with nearly three in five IT organizations expecting budget increases in 2019 and beyond, most executives view IT as a drag on—not a driver of—innovation. To put it rather starkly: a mere 6% consider IT a competitive differentiator and a full quarter of executives actually see IT as a business inhibitor (*Source: ESG 2019 Technology Spending Intention Survey*).

From Inhibitor to Digital Transformation Enabler

To be fair, IT's heart is in the right place. Cloud access does need to be controlled. Security and compliance must be maintained. Costs need to be managed. The challenge lies in adopting an approach to infrastructure management that facilitates innovation and improves organizational performance while maintaining comprehensive visibility and control over enterprise resources.

In this brief, we will outline an approach that allows IT leaders to become strategic business drivers. This approach meets users where they are, employing a customer-centric model for IT in which the needs of the IT end-user drive IT operations. To that end, this approach emphasizes a self-service model for provisioning resources—a model that builds in guardrails and controls so that DevOps teams get what they need when they need it without exposing the organization to avoidable risk, either on the security or financial front.

We will explore the principles and primary considerations behind this approach below, but our core belief is this: To tame the complexity inherent in today's enterprise IT infrastructure, IT leaders must adopt a flexible and extensible model for IT infrastructure management that relieves pressure on the IT organization while freeing the enterprise to take full advantage of emerging technologies and the latest development methodologies.

The 5 Principles of IT Infrastructure Management

The approach to IT Infrastructure Management advocated in this brief is based on five core principles:

- [1] Self-Service**
To not be a bottleneck, IT must institute a self-service delivery model, enabling developers to access resources when they need them.
- [2] Intelligent Automation**
Self-service depends on automation, but this automation needs to be intelligent. That is, it must ensure that resources accessed are appropriately configured to fit both the role and requirements of the end-user as well as the needs of the business. With intelligent automation, IT teams can build guardrails into provisioned resources - guardrails that cover everything from access privileges to how long provisioned resources remain available.
- [3] Comprehensive Visibility**
Business and IT leaders don't need visibility into some of their infrastructure; they need visibility into all of it. And they need this visibility consolidated into a single view, the proverbial "single pane of glass." Unified visibility enables modern IT leaders to always know where and how all resources have been deployed, and monitor all usage from a single platform.
- [4] Modular Extensibility**
In order to swiftly adopt and incorporate new technologies and services, modern IT leaders embrace modular, extensible frameworks. You need such frameworks, built on an IT-curated, standardized plug-in architecture, to support a rapidly evolving array of development tools, paradigms and priorities. Given the multiple clouds, environments, and automation tools (tools-Terraform, Ansible, Chef, Puppet and so on-covering application, code, and services automation) they need to support, IT teams need to go beyond the API and into a more flexible, rules- and object-based extensibility.
- [5] Continuous Insight**
Unified visibility into IT resource deployment and usage depends on the capture of data across workloads, clouds, and teams. On the one hand, this allows IT teams to quickly identify areas of risk, sprawl and inefficiency. On the other, and more impactfully, this enables IT to pursue data-driven resource planning. With increased accuracy in rate estimation, up-to-date views of inventory, and predictive provisioning based on recognized patterns of usage, IT proactively anticipates the needs of DevOps, becoming the enabler of innovation it should be.

Challenges Addressed and Overcome

Applying the principles outlined above allows IT teams to address the most pressing challenges they face today:

[1] Combatting the Sprawl and Security Risk of Shadow IT

Easy access to cloud resources leads developers and others to simply go out and get what they want, bypassing IT altogether. Such "shadow IT" not only creates unchecked (because unseen) cloud sprawl and drives runaway costs, it threatens security.

For example, serious security flaws have been found in Kubernetes, the de facto container orchestration platform for cloud applications.

"Kubernetes, like all software, is not immune to security issues - the privilege escalation flaw makes it possible for any user to gain full administrator privileges on any compute node being run in a Kubernetes cluster. This is a big deal." (Red Hat)

More than the security issues associated with specific emerging technology, the lack of visibility into and control over the configuration of "shadow" resources means lapses in DevSec go completely undetected. For example, developers sometimes embed credentials in their code, leading to serious breaches. To cite but one example, Uber was breached "because engineers failed to secure credentials on a GitHub site they were using." The credentials were then used to gain access to Amazon AWS instances supporting Uber ([VictorOps](#)).

Combined data breaches and losses from shadow IT applications (those outside of the IT department's control) are estimated to cost companies between \$1.5 trillion and \$1.8 trillion every year ([CloudCodes](#)). When self-service simplifies the provisioning process, developers have no need to acquire their own resources. And by automating configurations, consistent DevSec is maintained.

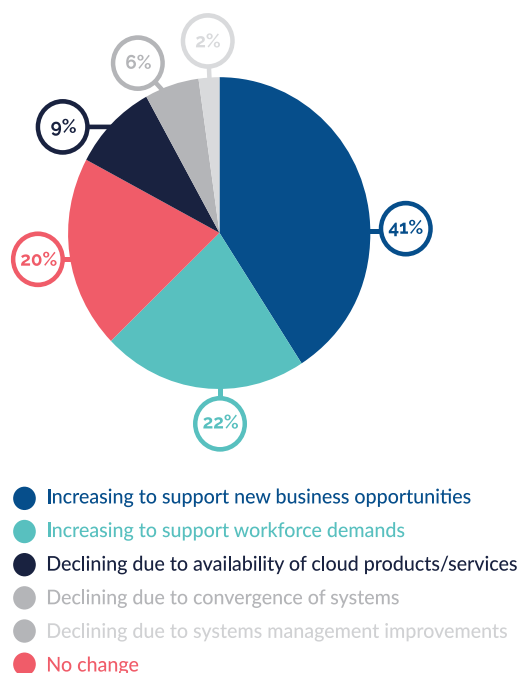
[2] Supporting Digital Transformation

As enterprises pursue digital transformation, embracing new models for innovation and undertaking radical improvement in operations, they need agility and speed. An approach to infrastructure management built around extensibility provides this agility and speed, allowing companies to rapidly adopt and integrate new technologies.

Such an openly extensible approach is critical. With over 60% of IT spend now driven by new business opportunities and the need to support the demands of the workforce (including DevOps), there is no way for IT to keep up without it.

Building Out IT Infrastructure

What are your organization's plans to build out or support IT infrastructure in the next 12 months compared with the last 12 months?



Data: Interop survey of 125 technology professionals, December 2018

(Source: Interop: 2019 State of IT Infrastructure report)

[3] Provisioning and Configuration in a Hybrid, Multi-cloud World

While it is true that AWS, Microsoft Azure and Google Cloud Platform all provide the same range of capabilities, they all do so in different ways, using different APIs, tool sets, nomenclature and taxonomies.

With intelligent automation, IT teams can create standardization across cloud environments. This makes it possible for DevOps and other teams to use the clouds that are most appropriate to their specific requirements, while allowing IT to maintain visibility into, and control over, both usage and cost.

Such controls can include optimized provisioning tailored to specific requests and power scheduling, governing the shutdown and startup of resources.

Tangible Benefits

[1] Greater Efficiency

Thanks to cross-cloud visibility provided by the single pane of glass, data-driven resource allocation driven by continuous insight, and intelligent automation, the efficiency of IT operations becomes increasingly optimized.

[2] True Operational Agility

Implementation of a regularly updated self-service catalog ensures that developers can develop applications more quickly, get products to market sooner, and ultimately increase the pace of revenue generation.

[3] Consistent Governance

Through intelligent automation, IT teams can mitigate compliance risk and maintain consistent governance. This becomes increasingly necessary as developers bring more and more tools into the enterprise—Terraform, Chef, Puppet, and so on—and with them configuration and script sprawl. By relying on blueprints and building in appropriate guardrails, IT ensures that only sanctioned configurations and scripts are ever in play.

[4] Comprehensive Control

The customer-centricity of these principles does not mean that IT relinquishes control. After all, controlling costs and ensuring security (that is, controlling security risk) are core IT missions. In fact, these principles actually increase and broaden the control that IT has over costs and security. By eliminating shadow IT through self-service, costly or unneeded resource allocation through intelligent automation, and quick identification of cost inefficiencies and emerging risks through unified visibility and continuous insight, these principles make it possible for IT to fulfill this part of its mission like never before.

[5] Accelerated Time to Value

While control is critical, and the cost savings achievable via these principles are real, modular extensibility is what really transforms the enterprise. First, by speeding up the development process and allowing the organization to rapidly integrate new innovations, extensibility accelerates time to value. Second, by supporting multiple options, it cuts proserve spend. Finally, it makes the overall practice of infrastructure management, especially blueprint orchestration, easier and faster.

The 5 Principles in the Real World



The Home Depot

» The Situation

The Home Depot had its sights set on continuous integration and continuous delivery (CI/CD), but getting a machine built took anywhere from several days to a week. Spinning up machines and getting rid of them just as quickly was a challenge. The resource provisioning process was causing major bottlenecks in business productivity. And the company lacked an effective way to track and manage resources, particularly in its hybrid cloud environment.

» The Solution

To eliminate bottlenecks, Home Depot focused on developing a **self-service model**, providing front-facing infrastructure services to developers. Taking advantage of CloudBolt's blueprints and APIs for **automation**, Home Depot's IT team now allows over 2,300 users to provision resources without submitting a ticket. What once took one to two weeks, now takes 20 minutes.

Furthermore, these users know that resources aren't free just because they're on-premises. By providing **visibility** into resource costs right at the time of ordering, CloudBolt drives rightsizing of resource use. This rightsizing is further enforced by limiting users to a certain dollar amount or CPU limits based on user permissions.

Finally, CloudBolt's user interface, multitude of plug-ins, and superior extensibility on the orchestration side made "integration with existing infrastructure a breeze." This **extensibility** in particular will support Home Depot's evolving IT strategy and facilitate the adoption and integration of Kubernetes, Docker, Terraform and other emerging technologies.



InterContinental Hotels Group (IHG)

» *The Situation*

Due to the size and complexity of their IT infrastructure (IHG owns over 5,000 hotels and manage 750,000 guest rooms), IHG utilizes four different public clouds. They want the flexibility of multiple public clouds so they can use the platform that provides the optimal environment for each workload, as well as to protect themselves against price increases and instabilities in any one public cloud. The challenge this created was that administrators needed to understand and use four different interfaces to locate, manage, and provision compute resources.

» *The Solution*

IHG decided to move all managed resources from VMware vRA to CloudBolt due to their ease of use, extensibility, and broad technology support. CloudBolt provided IHG a single user interface and API through which they could deploy complex apps to VMware and any of the four public clouds they use, manage these apps and their constituent servers over the course of their lifecycle, and automate their business policies and best practices surrounding server deployment and management.

IHG uses CloudBolt's interface as a **self-service** portal available to development, QA, and production support groups. They are now all empowered to order what they need, when they need it without having to open a ticket for IT and wait for that group to fulfill the request. Since consumers of IT resources can get what they need when they need it, developers can deploy complex application stacks within minutes of realizing they need them.

IHG now also uses **comprehensive visibility** and **intelligent automation** to control VM sprawl and protect against unexpectedly large bills from the vendors. Through the use of expiration dates for servers, configurable expiration behavior, visibility into all VMs across all technologies, quotas, cost tracking, and easy deprovisioning of servers and services, IHG ensures that they pay only for what they need and use.

neustar Neustar

» *The Situation*

Neustar is a 1,500-employee, NYSE-traded provider of real-time information and analysis. With over 10,000 VMs running across the organization, they relied heavily on AWS to meet the service delivery demands of their customers. This resulted in a hefty AWS bill and an expensive datacenter being underutilized. Neustar needed a solution that would better leverage the existing capital investment and deliver services to their customers in a timely and simple manner. Specifically, an "AWS-like" experience combined with the necessary visibility and control of costs and assets.

» *The Solution*

Neustar relied on AWS as the service broker. By migrating to CloudBolt, their Core Services team became equipped with the resources to be the "broker" of IT resources; regardless if the resources are in VMware or AWS. The ordering form for any VM has become standardized and run through IT, service delivery speed was met, and Core Services has a holistic view into who owns it, where it is deployed, when it expires, and how much it costs.

CloudBolt enables Neustar to leverage the benefits of both public and private cloud seamlessly, minimizing external spend when internal resources can fill the need. Its users in turn get the VM resources they need, faster, via one-click ordering from an easy-to-use interface.

The 5 Principles and Your Organization

To tame enterprise IT infrastructure complexity, IT leaders must adopt a flexible and extensible model for IT infrastructure management that relieves pressure on the IT organization while freeing the enterprise and DevOps to take full advantage of emerging and future technologies.

With its leading enterprise cloud management platform, CloudBolt can help you adopt an approach to infrastructure management that facilitates innovation and improves organizational performance, while maintaining comprehensive visibility and control over enterprise resources.

Here's how we can help you can achieve unparalleled time-to-value for your hybrid, multi-cloud cloud management strategy..and become a strategic business driver for your organization: Learn more about **CloudBolt** at www.cloudbolt.io or request a [free trial of CloudBolt](#).



About CloudBolt: Agility, Control, and Efficiency in a Hybrid Cloud World

CloudBolt is the leading cloud management platform for the enterprise. Deployed in minutes, CloudBolt helps IT provision, orchestrate, and manage their private cloud, public cloud, and hybrid cloud resources—quickly, cost-effectively, and securely—while providing developers with anywhere, anytime access to those resources through a self-service catalog.