

Automation—Your Path to the Cloud

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EXECUTIVE SUMMARY

When considering a move to the cloud, it can be difficult to know where to start. Clearly, the smart place to begin is with automation. You can't get the benefits of the cloud—more cost-effective service delivery, greater flexibility, and faster time to market (TTM) for new services—without automating end-to-end processes. However, not all automation is equal. By getting automation right in your data center, you lay the foundation for the cloud and gain value as you go.

The lifecycle of an IT resource begins with provisioning, whether in the data center or in the cloud. Because of this, much attention has been spent on automating the various actions required to provision a new resource. There are many different possible approaches here, from vendor- and platform-specific tools, to open-source frameworks, to more sophisticated offerings that are able to deploy complete application stacks in a single, logical operation.

Installing basic operating system is easy enough to automate, even at scale. The value to users, however, is not in the operating system but in the entire business service that runs on that basic layer. This means that to provision a service, it is not enough to deploy an operating system. It will be necessary to roll out all of the other required components, including middleware, databases, and multitiered application environments. Automation at this level also means looking beyond the server and orchestrating your network, storage, and services, as well as the set of technologies that support those services and their accompanying service level agreements (SLAs).

To prepare for success in the cloud, you must go beyond simply provisioning the base operating system and reaching all of its applications and configurations—the entire stack. A key part of that process is rolling out the custom application code that really makes the transition from undifferentiated technical infrastructure to valuable business service.

This last step is particularly important because there may be many application releases over the lifecycle of a server. If a physical server lasts around four years, the lifetime of a virtual server may be much shorter—or much longer. After all, there is no hardware that can wear out. When organizations are working with DevOps principles, releases may occur even as rapidly as several times a day. There is no way to maintain that pace without intelligent automation.

Infrastructure also needs to be patched and audited regularly. Once upon a time, it was possible to concentrate on perimeter security, segmenting the network, defining DMZs, and assuming that what was inside the firewall was relatively safe. That assumption no longer holds. With Servers in the cloud, virtual servers that move around, servers created with a couple of clicks and no oversight or even awareness on IT's part, IT needs defense in depth. At a basic level, this requires regular scans of the entire IT estate; beyond that, a plan will also be needed to correct the problems that are identified.

Zero Options= Zero Mileage

What does end-to-end service provisioning look like? To paint a clearer picture, compare service provisioning to auto manufacturing. Think about the key components of an automobile. A standard yet essential component of any vehicle is the chassis. Another key component is the engine. Some components are not essential but rather are add-ons or “nice to have,” such as automatic windows and locks or cruise control.

Think of the basic infrastructure of a service as being like the chassis of a car and the operating system and basic applications as being like the engine. With the cloud, the service provider often stops there—offering little more than the “chassis” and the “engine” to get around in, as your organization attempts to do business. The service provider may offer only the most basic services—the bare necessities—without thinking about the additional services that the business wants and needs to be competitive.

When it comes to cars and trucks—and cloud services—optional features are important. Consumers of services demand options to match their needs. For example, if a company delivers vegetables, it needs a truck equipped with refrigeration. If your company is carrying heavy freight, you need a towing mechanism. An ordinary truck would not meet these requirements. With IT, an optional feature in the cloud might be the ability to deploy a preconfigured environment for a developer, which might include a database and an application server.

What if truck manufacturers created vehicles as one model, with no options? If you wanted refrigeration (or a towing mechanism, or electric windows or cruise control), you'd need to install it yourself. This is just the position, service-wise, in which some enterprises are finding themselves as they begin to investigate cloud. When it comes to provisioning services, it's important for IT to be able to deliver the range of services its users are seeking without requiring an extensive amount of work from the user.

As IT organizations move more business-critical and complex services to the cloud, the “nice to haves,” such as fully configured enterprise-level application or database servers, have become necessities. Manually configured, services in the cloud lose many of the anticipated benefits, since new capacity could take days or weeks to deliver. Automation enables you to deliver a service consistently and rapidly.

In the same way, regular scans for patching, security, and compliance may appear to be something that can be postponed until later in the project. The early days of the project naturally bring focus on provisioning, and therefore on defining an initial environment that is secure and compatible with application requirements. Once deployed, though, the desired configurations will inevitably begin to drift away from that desired state as a result of manual and automated actions. Just as problematic, service definitions and templates may be updated without those updates being distributed to running instances.

Configuration drift can easily develop into a major issue, with consequences that vary depending on perspectives. Even if you rolled out a secure configuration, how can you be sure that the configuration will stay secure over time? Can you be certain it is secure right now? When the consequences could include a security breach, a compliance audit failure with attendant penalties, or a catastrophic failure in an application roll-out, trusting that things will not have changed too much is not a viable strategy.

BUILD CORE COMPETENCIES FOR THE CLOUD

Do you need a fully automated data center before you can even contemplate moving to the cloud? Not really. Data center automation and service provisioning are not one-size-fits-all services. A few enterprises are attempting transformational installs, where they start from scratch and do everything in a single push. While an all-or-nothing strategy is fine for some groups, especially for organizations without much legacy IT, this approach will not necessarily be best for every organization. Instead, many enterprises take a phased approach rather than automating the entire data center at once. This enables IT to focus on incremental projects that offer a greater likelihood of real value for the organization.

You can start developing standardized automation processes long before you enter the cloud. For example, you can design a server-provisioning or application-release process and later use an enterprise service-provisioning solution to “elevate” that standardized method as a service, promoting it to the cloud when you're ready. You should also automate tasks that do not require deploying new infrastructure: deploying a new version of an existing application, auditing an environment for security or compliance, or rolling out the latest patches and service packs. The enterprise provisioning solution should not only automate the process but also provide an integrated service catalog for the standardized services that you build.

By building core competencies, enterprises can obtain real value on the way to achieving the goal of cloud computing. Self-service and service catalogs are essential to building and running common, standardized services. Every time a user can obtain a new service or modify an existing one without needing manual support from IT, there is an immediate benefit in cost savings and user satisfaction, and a longer term benefit in agility for the whole organization. That's because these resources provide a standard interface for the end-user experience while reducing the complexity of deliveries for the IT organization. The result is a lower barrier to entry for IT: Projects that it would not have been feasible to support under the old model can be delivered rapidly and bring value to the organization.

HOW TECHNOLOGY CAN HELP

A consistent set of automation technologies can play a key role in managing the entire IT operations environment. The ideal solution is one that would not disturb the daily duties of IT administrators and decision makers, and yet would manage to invisibly break down operational silos that have vexed senior IT managers for so long.

Emerging solutions for service provisioning allow for the consistent deployment of complete business services across applications, servers, networks, databases, and client devices using a defined architecture for provisioning, compliance, and release management. Technology like this can help IT organizations accelerate the delivery of new services, reduce the risk associated with change, improve productivity, lower management costs, and enforce operational, security, and regulatory compliance.

It's not enough to just build out services over time. Automation also plays a critical role in the maintaining services in the cloud. A service provisioning system that can build a service, but cannot update and configure that service over time, will reduce the value of the cloud for your organization. The automation system must be able to update and maintain configurations without the entire service needing to be reprovisioned. This means that the automation should not rely too heavily on templates and images, as is common in the cloud. Rather, it should be able to change configurations without creating downtime due to errors.

This orchestrated approach is even more important for application releases. Deploying an enterprise-grade application is rarely as simple as dropping a file over the top of its previous version. Many small changes need to be made in strict sequence, including actions on different servers in multi-tiered and clustered environments. These changes must be executed rapidly, within small windows of time, and be extremely predictable and repeatable to enable the high frequency of releases that modern application lifecycles require.

Additionally, in the cloud, both security and operation continue to be important—perhaps even more so. Just as with your traditional data center, the cloud needs to comply with your operational standards, security standards, and any applicable regulatory policies. This means that the automation platform must be able to integrate compliance processes with the configuration management processes after the services have been provisioned.

Finally, the cloud infrastructure must still be a part of the larger IT environment. As a result, the cloud should be integrated with any IT management processes already in place. This includes processes such as change, incident, problem, and release management. Formal processes will be required to avoid conflicts and negative impact on operational services. This ensures that the cloud environment does not become separate from the normal operational processes that have been developed over the years.

LOOKING AHEAD

Cloud computing has quickly taken automation from being a “nice to have” and turned it into an absolute “musthave.” No longer can problems be solved simply by hiring more people—the complexities of the data center are expanding too rapidly, and pressures to hold down costs are greater than ever. You have to be able to extract maximum value with minimum expense. Automation is the only way you can consistently deliver a service with the fewest resources.

Now is the time to evolve automation so that you can provide more than the “bare-chassis, zero-option” vehicle needed for your business to operate in the cloud. Automation will help you to make the right set of options available to users—ones that will help your enterprise remain competitive as it enters the cloud.

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