Customer Challenge: Life Before the Cloud

One of the world’s largest multinational corporations, with an annual revenue of approximately $150 billion and over 300,000 employees, required a better way of providing IT resources to its numerous business units. These business units were free to choose between acquiring IT resources through the organization’s Central Infrastructure Group (CIG) or purchasing what they need from outside infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) offerings. Recently, CIG was faced with an increasing number of heterogeneous and complex resource requests, leading to a significant strain on the organization to consistently provide secure and correctly configured systems at acceptable provisioning times and cost. As the internally developed Information Technology Infrastructure Library (ITIL) provisioning system was static, it was only able to serve approximately 10 percent of overall global resource requests in a zero-touch manner. The vast majority of resource requests required significant manual intervention by CIG staff, leading to wait times of often multiple weeks and increased provisioning cost that had to be charged back to the client business unit.

This issue had prompted a rapidly increasing number of CIG customers to turn to Amazon Web Services (AWS) to obtain server, network, and storage resources cheaply and instantaneously. The increasing reliance on AWS provoked the organization’s chief technology officer (CTO) and chief information officer (CIO) to think about internal alternatives. Instead of having a myriad of IT resources “floating around in the public cloud,” the leadership team was looking for a solution to restore governance and security.

Cloud Requirements

CIG was tasked to obtain and deploy a low-touch provisioning solution that could compete with AWS in cost, end-user convenience and speed, while keeping the company’s data in house or at least under corporate governance. At the same time, the new solution should address the following issues:

Life cycle management: To prevent resource sprawl, the private cloud should go beyond simply cloning of virtual machine images and provide actual life cycle management. CIG aimed to provide a substantial library of numerous middleware, application and operating system stacks. All of these images needed to be secured, patched, configured consistently, and eventually retired and archived.
Governance: Bringing resource provisioning back in house meant that CIG would assume the central governance role, issuing and enforcing policies that would ensure the efficient and secure operation of all resources. Ultimately, CIG would delegate some of this responsibility to the individual business unit customers, so that they would be able to create their own policies, within the constraints of the overall CIG policy framework.

Infrastructure integration: Like any IT organization, CIG had accumulated a number of cornerstone applications, such as HP Server Automation, CA Technologies SiteMinder, and the ServiceNow self-service platform. Due to significant investments made, replacing these platforms was not an option. The new cloud framework had to be able to leverage the capabilities of the existing software infrastructure to provide a complete solution. Therefore, CIG was looking for a cloud platform with advanced extensibility and orchestration capabilities.

Public cloud integration: As customers were accustomed to the low cost and high scalability offered by AWS and other public cloud services, it was essential that the new private cloud framework easily integrate with these frameworks. This would allow CIG to provision public cloud resources, such as AWS servers, under the central governance and security model of a private cloud.

Why VMware vCloud Automation Center
The market for cloud orchestration and automation frameworks comprises dozens of solutions, all with their own strengths and weaknesses. After an initial market scan, CIG considered four major private cloud frameworks. “Only the VMware vCloud Automation Center could offer the optimal combination of out-of-the-box capabilities, business focus and extensibility,” said the CIG senior IT executive responsible for the selection process. The fact that VMware vCloud Automation Center could be integrated with many existing enterprise systems without customization was essential, due to the short time available for the implementation.

Out-of-the-Box Capabilities
One of the project preconditions was that the initial sandbox deployment would be up and running within 45 days. Therefore, selecting a software package that would work out of the box without customizations and with a moderate learning curve was essential.

The fact that VMware vCloud Automation Center could be installed quickly and supported HP Server Automation without any customizations played a major role in the purchasing decision. Furthermore, as all vCloud Automation Center functionality was available through a representational state transfer (REST) API, CIG was confident that replacing the standard vCloud Automation Center service catalog with the already existing ServiceNow self-service portal would be simple.

vCloud Automation Center managed the resource provisioning process through so-called blueprints, consisting of security configurations, policies, machine templates, SLA definitions, cost profiles and server tier definitions. By initially providing these blueprints, CIG could easily and consistently offer all popular application stacks to its customers.

Extensibility
CIG operates eight datacenters worldwide, with numerous commercial and custom enterprise management software solutions and best practices. An ideal cloud platform would be able to take advantage of the investments made in these existing management applications, instead of replacing them.

1 This EMA case study was conducted shortly before the acquisition of DynamicOps by VMware, when vCloud Automation Center was distributed as DynamicOps Cloud Suite.
vCloud Automation Center provided CIG with the extensibility required to leverage existing technologies, while at the same time being able to integrate with almost any type of systems that may be procured in the future. To be able to offer this extensibility, vCloud Automation Center provided two different tools, in addition to the above-described out-of-the-box integration capabilities:

- **vCloud Automation Center Designer** is a visual development environment that allows the administrator to create custom workflows and integrate with enterprise systems that are not supported out of the box. Designer provides a simple visual environment to make the development effort as easy as possible.

- **vCloud Automation Center Development Kit** is offered in the form of a plug-in for Microsoft Visual Studio, allowing developers to accommodate entirely new use cases, such as storage as a service, delivering virtual machines from an Oracle VM, implementing location-aware virtual desktops, or automating the new employee onboarding process.

A CIG IT executive summarized the importance of extensibility by stating, “Since we are a service provider we are always getting ‘Hey, can you do this or that.’ With vCloud Automation Center extensibility, we can quickly integrate with anything out in the marketplace.”

The Implementation Process

Due to the importance of standing up the initial cloud platform within only 45 days, while at the same time not losing sight of the long-term goal of providing a comprehensive self-service platform for the entire organization, CIG decided to divide this project into the following three phases.

**Phase I – Sandbox Deployment**

The goal of phase I was to show quick initial success, by standing up a noncustomized self-service environment, based on the out-of-the-box vCloud Automation Center self-service portal, within 45 days in one central datacenter. After a little more than one month, CIG was able to offer fully automated self-service provisioning of server resources to its clients. To prevent server sprawl, clients were charged for their resources per day, which led to average life cycles per server of about 10 days. This initial offering very quickly became very popular, leading to approximately 400 active virtual servers running at any given time.

**Phase II – Basic VMware Cloud**

After the successful initial deployment of the vCloud Automation Center platform, CIG was ready to take on the next stage of its initial private cloud rollout. This next step was aimed at automating the provisioning of VMware server resources across all eight CIG datacenters worldwide.

In order to achieve this next step, the vCloud Automation Center platform had to be integrated with the following four core systems:

- **HP Server Automation** is used for server and application discovery, provisioning, upgrade, patching, configuration and compliance management. Leveraging the preexisting investment in HP Server Automation was essential, as each self-service cloud environment requires an efficient, policy-driven IT process automation solution to manage the underlying server and software maintenance workflows.

2 Formerly DynamicOps Design Center

3 Formerly DynamicOps Cloud Development Kit

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“One of the biggest surprises with vCloud Automation Center was that we were able to integrate our new cloud environment with HP Server Automation right out of the box.”
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• Managing access to the self-service portal through CA Technologies SiteMinder enabled CIG to take advantage of its existing reliable, scalable, and consistent authentication and authorization solution without having to manage a separate user database for its private cloud. The SiteMinder integration was achieved through the use of vCloud Automation Center Development Kit.

• CIG completed the integration of the vCloud Automation Center platform with the company’s ServiceNow self-service portal within less than one month. While the initial cloud deployment still took advantage of the vCloud Automation Center out-of-the-box service portal, today CIG customers can manage their server resources from the familiar ServiceNow interface. The connection to vCloud Automation Center was established via REST interface.

• Amazon EC2 support is offered out of the box, allowing CIG to provide Amazon cloud resources to its clients, while still closely managing these resources. Amazon EC2 servers are deployed and managed through vCloud Automation Center in the same way as VMware resources.

As a result of phase II of the CIG private cloud project, and only six months after the completion of phase I, the share of server resources that were provisioned without manual intervention had increased from 10 percent before project start to approximately 60 percent. At this point, CIG was running approximately 3,000 virtual servers under the management of the vCloud Automation Center platform.

**Phase III – Commercial Cloud**

The future phase III of the CIG private cloud deployment project aims at further increasing the 60 percent zero-touch provisioning rate, by adding on the following elements:

• **Multi-tenancy:** Some of CIG’s customers require Payment Card Industry-, HIPAA- and SOX-compliant server infrastructure solutions that can only be achieved in a multi-tenancy environment.

• **Hardware provisioning:** CIG is using Cisco UCS and HP BladeCenter servers. vCloud Automation Center will be configured to allow authorized end users to provision physical blades, in addition to virtual machines.

• **Oracle VM Manager:** While Oracle’s VMM is not as popular as VMware vCenter, CIG customers have repeatedly requested at least basic support for self-provisioning Oracle resources.

• **Opscode Chef:** CIG is evaluating the option of integrating vCloud Automation Center with Opscode Chef for dynamic application stack provisioning, configuration and management.

• **Tiered service offerings:** CIG is planning to provide tiered service offerings, with provisioning blueprints for gold-, silver-, and bronze-grade environments. This will be a further step to reducing cost: only the tier of resources required for a specific task will be provided.

• **Advanced workflows:** To further gain provisioning and management efficiencies, CIG is planning on designing workflows tying user groups to specific provisioning templates. This will reduce complexity for end users by presenting them with resources that are relevant to their specific job role.

• **Rackspace cloud support:** In addition to supporting Amazon EC2, CIG will start supporting provisioning resources based on the Rackspace cloud.
**Project Results**

The success of the vCloud Automation Center private cloud solution for CIG is best expressed through two figures:

- **Dramatically increased self-provisioning rate:** Before this project, the rate of zero-touch, self-service provisioning of server resources was at 10 percent. Today, approximately 60 percent of server resources are automatically provisioned and managed.

- **Number of servers under vCloud Automation Center management:** Approximately 3,000 out of 5,000 active virtual servers are currently managed through the vCloud Automation Center platform.

Additionally, CIG was able to significantly cut back on contractors, who used to assist with the manual provisioning of infrastructure resources. Also, the use of Amazon cloud resources has declined, bringing a larger share of servers back under CIG governance. This decreased use of AWS can be seen as an important indicator for a high degree of customer satisfaction, as CIG customers still have the choice to “swipe their credit cards” and use an external cloud provider. One end customer summed it up as follows: “This is the service we’ve been looking for. IT as an obstacle is finally removed.”

**EMA Perspective**

When planning its private cloud, CIG was faced with the same problem that almost any organization has to tackle when considering a private cloud: *How can I implement self-service provisioning on top of our existing datacenter management capabilities?*

In EMA’s opinion, the main quality criterion for any cloud framework is the ability to fit in with the rest of the datacenter management software. These existing management systems often have been refined over many years and contain corporate knowledge that must be built upon, instead of replaced by a shiny new cloud environment.

EMA believes that VMware’s vCloud Automation Center cloud offerings aim at exactly the right target, by presenting maximum of out-of-the-box integration capabilities while at the same time offering two different design environments: one simple and easy-to-use (vCloud Automation Center Designer), and one more complex and flexible (vCloud Automation Center Development Kit).

CIG implemented a private cloud to achieve agility and resource optimization through automation. The increase of the self-provisioning rate from 10 percent at project start to approximately 60 percent after six months shows that both goals were achieved in an impressive manner.

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**About EMA**

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help its clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise line of business users, IT professionals and IT vendors at www.enterprisemanagement.com or blogs.enterprisemanagement.com. You can also follow EMA on Twitter or Facebook.