Cisco CloudCenter Solution Use Case: Hybrid IT as a Service

Overview

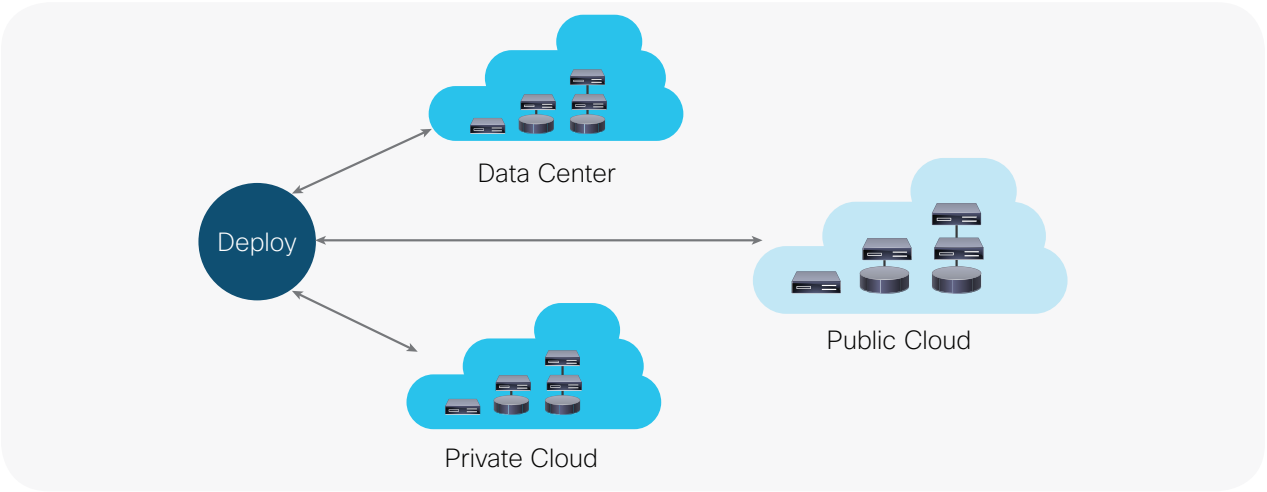
Enterprises are using applications to gain competitive advantage. Success in this technology-based environment requires agility and flexibility. And if IT wants to be the primary technology solution partner for the business, the IT staff needs processes and tools in place to deliver solutions at a much faster pace.

As digital services propel more and more business processes, cloud technology is proving to be a crucial addition to the IT services portfolio. It is far more scalable, and in many cases more cost effective, than its predecessors.

Cloud Infrastructure as a Service (IaaS) and software-defined data center technologies—virtualized computing, networking, and storage—have helped IT address the "fast IT" challenge.

But not all services are or will be cloud based. That's why an effective IT-as-a-Service (ITaaS) strategy must be hybrid and must encompass a range of service delivery options. As Figure 1 illustrates, that strategy must include a mix of services sourced from the data center, private cloud, and public cloud. In implementing that strategy, IT must continue to meet cost, service-quality, security, and compliance requirements.

Figure 1. An Effective ITaaS Strategy Includes a Range of Options



The Challenge

ITaaS is an important part of a hybrid IT strategy. It delivers value to a range of constituents:

- **For the business:** It offers the flexibility and scalability to combine services from a mix of sources based in the data center and cloud. For some uses, it offers the capability to scale costs with usage, by using a pay-per-use model. For other uses, it offers the security and compliance delivered by datacenter control.
- **For users:** It offers a fast and easy way for people to get the services they need when they need them, in a way that is similar to a public cloud service provider experience.
- **For IT operations:** Highly automated and standardized service delivery can deliver efficiency-related benefits such as predictable results, reduced time spent on provisioning work that adds little value to the business, and fewer manual processes and so less risk from problems caused by human errors.

However, to succeed IT must address three major challenges:

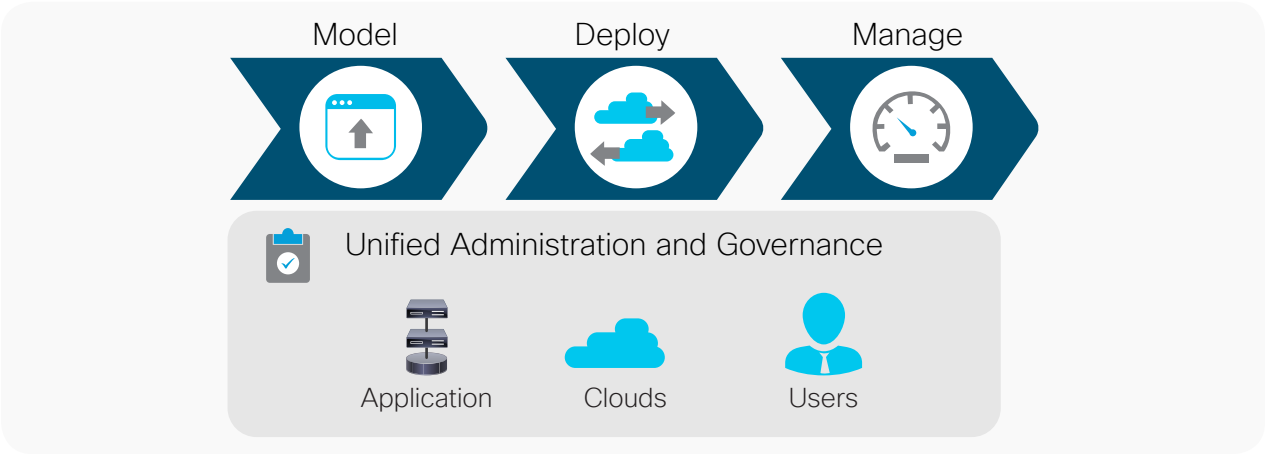
- **Balance agility and control.** Users want to request and access IT services on demand. Yet IT must control who can do what, and where, when, and how much services can be provided, so it can meet cost, security, and compliance requirements. Finding the right balance requires thoughtful design of user interfaces and processes to make it easy for people to get what they need within boundaries that don't impede their progress. It also requires policy-driven automation with IT visibility and control across a range of users, applications, and service-sourcing environments.
- **Source services from heterogeneous environments.** Successful delivery of ITaaS requires a high degree of service standardization and automation. And standardization across data center and private and public cloud infrastructure requires automation that is not environment specific and does not result in application lock-in to any one environment.
- **Move beyond infrastructure.** Users want more than raw infrastructure resources. They want instant application deployment with access to fully configured application stacks that include databases, application and web servers, and load balancers, including resources delivered through containers. Many automation solutions are infrastructure focused, so adding application automation to infrastructure automation introduces layers of complexity that can undermine the cost and agility benefits of the ITaaS strategy.

The answer: The Cisco CloudCenter solution

The Cisco CloudCenter™ platform is an excellent hybrid ITaaS solution. Its unique application-defined technology abstracts applications from underlying infrastructure environments. It helps ensure that the infrastructure adapts to meet the deployment and management requirements of each application. As shown in Figure 2, the solution empowers users with a consistent, self-service, and on-demand experience that doesn't vary across service delivery environments, and it gives IT comprehensive governance and control.

Users can quickly and easily model, deploy, and manage applications in any environment. Whether you are deploying simple or complex workloads to one or many environments, the Cisco CloudCenter solution enables users to serve themselves without having to understand the nuances of the underlying automation mechanisms or cloud environments.

Figure 2. Full Lifecycle Management



Administrators gain single-pane visibility and control that spans all boundaries of applications, clouds, and users. They can manage cloud accounts and permissions, set financial controls, and report on usage and costs. They can also manage tenants and users through federated multitenant management capabilities and Role-Based Access Control (RBAC). Tag-based automation makes it easy for IT to guide user decisions and underlying automation, without slowing down users or requiring them to have detailed knowledge of rules and policies.

With the Cisco CloudCenter solution, IT can deliver a flexible mix of standardized, automated infrastructure and application services across a diverse portfolio of data center, private cloud, and public cloud environments—all while offering the right balance of agility and control.

Three design patterns

The Cisco CloudCenter solution automates the deployment of workloads that range in complexity from a single virtual machine or operating system image to complex application configurations with 50 or more components. Users can start simple and grow with three basic design patterns:

- **On-demand infrastructure:** IT can provide access to commonly requested server configurations. Users can deploy a virtual machine or OS image to a data center managed by VMware vCenter or Cisco UCS® Director, to a private cloud such as OpenStack or CloudStack, or to any public cloud provider. IT can specify who can deploy resources to which environments by offering bundles or plans that limit usage or costs. It can also limit deployments to specific environments if required. Consistent, repeatable, and automated deployment without involving the IT service desk saves time and money for both users and IT operations personnel.
- **On-demand applications:** For many users, self-service deployment of a virtual machine is not enough. With the Cisco CloudCenter solution, IT can move beyond simple virtual machine provisioning and offer self-service deployment of fully configured application stacks. The capability to deploy a full application stack eliminates the unproductive time that people may otherwise spend manually installing the database, load balancers, and application and web servers that are often required to test the latest build.

  By offering automated deployment of more than infrastructure resources, IT can tailor services for specific users and groups. The Cisco CloudCenter solution supports common application types, including batch, parallel processing, and cluster, as well as traditional multitier applications and loosely coupled containerized topologies. The solution also supports many popular application technologies, including Java, .NET, LAMP, Ruby on Rails, and Hadoop.
- **Service broker:** IT can offer a range of service delivery options as part of a hybrid IT strategy that meets a wide range of requirements. In so doing, IT can remain the preferred service provider for the business even if some services are outsourced to public cloud providers. With the CloudCenter solution, IT can offer a single platform from which people can request, deploy, and manage—on demand—infrastructure and application stacks in any data center, private cloud, and public cloud environment. This capability enables IT to provide rapid access while still maintaining control.

Real-world examples

Cisco's customers have used the power of the Cisco CloudCenter platform in a range of ITaaS scenarios:

- **A college of medicine** IT organization serves a wide range of independent research departments. Previously, research scientists were deploying applications and data to public cloud service providers. This shadow IT activity resulted in underutilization of data center resources and exposed the college to potential HIPAA violations.

  With the Cisco CloudCenter solution, IT offers self-service, on-demand access to simple database services that are deployed to centralized storage resources that have the high levels of security required for sensitive data. Users get instant access to needed resources. IT gets more efficient resource utilization, gains control of regulated data, and eliminates shadow IT.

Advanced features

Cisco CloudCenter advanced features enable IT to maintain a critical balance of user agility and IT governance and control—a balance required for an effective ITaaS strategy.

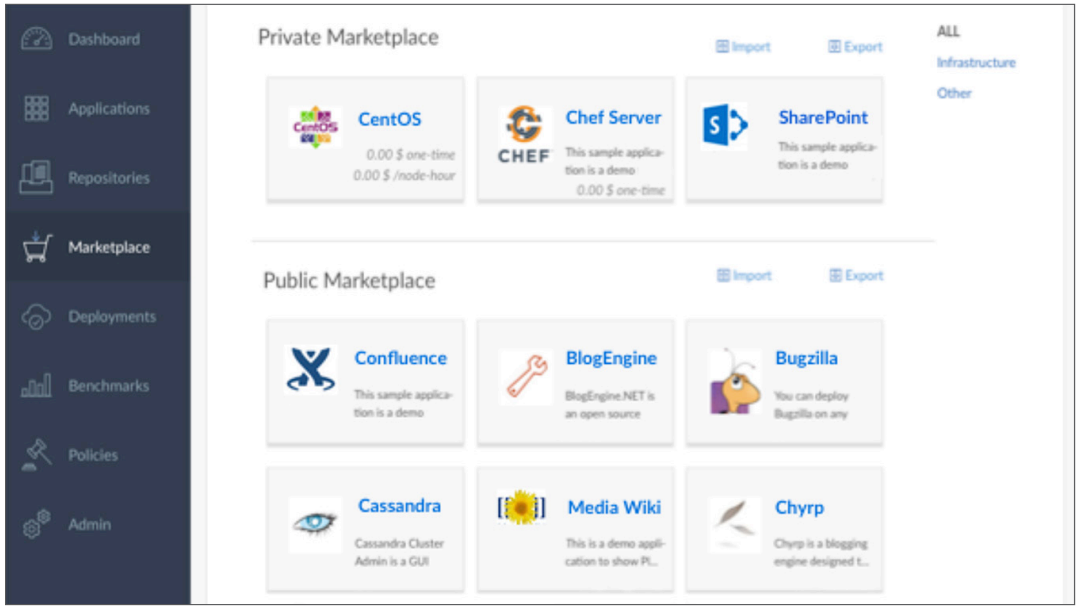
One-click deployment

The application profile is a user-created blueprint that defines the deployment and management requirements of a simple OS image or a complex multitier or multiservice application. Any authorized user can deploy the profile to any supported data center, private cloud, or public cloud.

As Figure 3 shows, users who are part of different tenants can share application profiles by posting to or importing from a public marketplace.

Users and groups within a tenant can share profiles through a private marketplace. Users can also deploy profiles through an API, so they can integrate them into a custom front end or an existing service catalog such as ServiceNow.

Figure 3. Application Marketplace



- **A large, global telco** runs an innovation lab that serves a broad range of internal and external customers. The company needed a single cloud management solution to serve a complex organization that includes various groups that must be isolated as separate tenants.

  The Cisco CloudCenter solution delivers a powerful multitenant ITaaS platform with strong isolation between tenants, each of which consumes a core set of shared IT services. The solution supports a multicloud service-broker strategy that delivers a broad range of cloud services. Users choose from seven different cloud regions through separate custom portals, with each region having separate usage metering and billing processes.

Tag-Based Governance

Cisco CloudCenter administrators can control user actions with tag-based automation that simplifies users' placement, deployment, and run-time decisions.

The administrator identifies tags with easily understandable labels such as Dev, Prod, or HIPAA (Health Insurance Portability and Accountability Act). The administrator specifies the rules to be associated with each tag: for example, rules that specify the selection of the appropriate deployment environment, firewall rules, or aging-policy rules. When users deploy an application profile, they simply add the required tags. They don't have to understand the underlying rules and policies.

- **Placement decisions:** Tags can specify deployment to the appropriate deployment environment. For example, a tag labeled Dev may specify deployment to Amazon Web Services (AWS), and a tag labeled HIPAA may specify deployment to a data center with a Cisco ACI managed network with microsegmentation that is appropriate for sensitive data.
- **Deployment decisions:** Tags can specify firewall rules and port settings. A tag can be linked to a security profile and applied to a specific tier or to an entire deployment. A Dev tag, for example, may specify a security profile that opens all ports. A Prod tag may specify a security profile that closes all ports except the one needed for network monitoring.
- **Run-time decisions:** Tags can specify day-two operations. For example, tags can be used to specify aging and scaling policies that are monitored and enforced over time. By linking tags to run-time policies, administrators can control ongoing management of the workloads deployed by the Cisco CloudCenter solution.

Benchmark

The Cisco CloudCenter solution includes a benchmark feature that can help IT optimize its ITaaS strategy in two main ways:

- **Optimize cloud placement.** The user can deploy a single application profile to different deployment environments. The CloudCenter solution returns a report on the price-to-performance ratio for each deployment. The reports can be compared to identify the best deployment environment for that workload.
- **Optimize instance sizing.** The user can deploy multiple variations of a single instance to a single cloud and compare the resulting price-to-performance reports to determine the most cost-effective configuration. This feature helps IT reduce costs and improve cost predictability when multiple factors are involved that affect cost and performance.

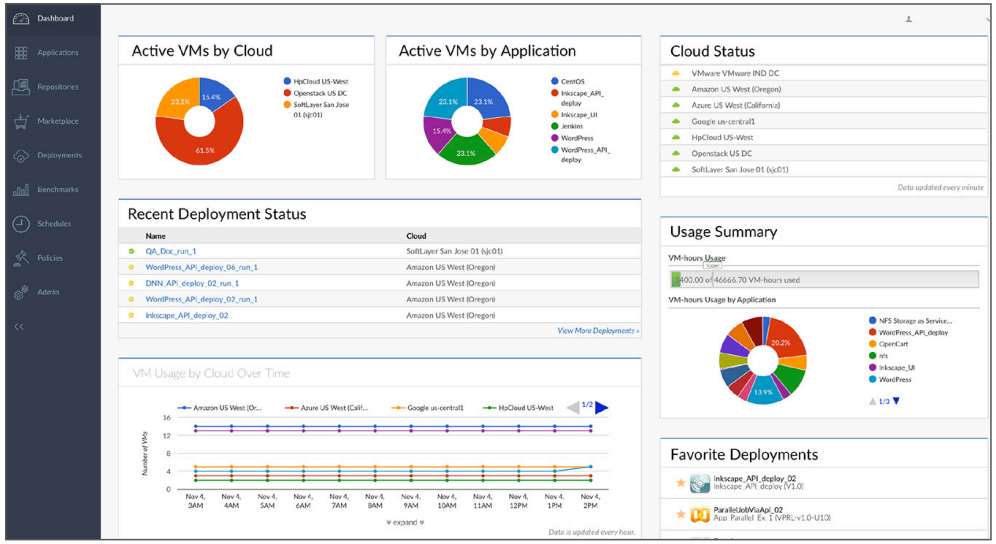
Dashboard

As Figure 4 shows, the Cisco CloudCenter solution gives administrators a consolidated view of all application deployment activity across all data center, private cloud, and public cloud environments. The Cisco CloudCenter dashboard provides an at-a-glance view of the cloud status and the active virtual machines in each environment. The administrator can also view the deployment status and virtual machine usage by application. The dashboard provides hover-over and drilldown capabilities for retrieving additional details about items of interest.

- **A city government** IT organization needed to shift to a consumptionbased service delivery and chargeback strategy to use taxpayer money more effectively in meeting the service needs of 50 different city departments. IT wanted to offer basic infrastructure services, such as Microsoft Windows Server 2008 and Ubuntu virtual machines, deployed on demand to AWS or Microsoft Azure clouds or to a traditional data center.

  The Cisco CloudCenter solution separates tenants and allows each to consume a basic set of core services. IT can control usage based on predetermined plans and bundles according to each department's budget restrictions. Moreover, IT can generate detailed accounting reports that show usage and costs by department, and forward the reports to the offices of the mayor and city controller.

Figure 4. Consolidated View Across Data Center, Private Clouds, and Public Clouds



Cost controls and reporting

The Cisco CloudCenter solution provides effective cost controls supported by comprehensive usage and cost reporting. IT can apply a wide mix of cost- and usage-based plans and bundles that help ensure that self-service does not result in cost overruns that undermine the value of the ITaaS strategy. IT can generate usage and cost reports by specific users, groups, and business units, and by specific applications, clouds, and cloud accounts.

C22-737217-01 07/17

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