Cisco Intelligent Automation for Cloud

Introduction

IT is under increasing pressure to deliver services to the business more quickly and inexpensively than ever before. Cloud computing can help IT meet these challenges. The cloud offers the promise of evolving the data center from a static and inflexible architecture into a highly efficient and flexible one, providing users with self-service access to IT offerings with fast, automated delivery. The question has changed from “Should we embrace cloud computing?” to “How can we best use the cloud?” Options abound, but for IT to deliver cloud services, it will need to:

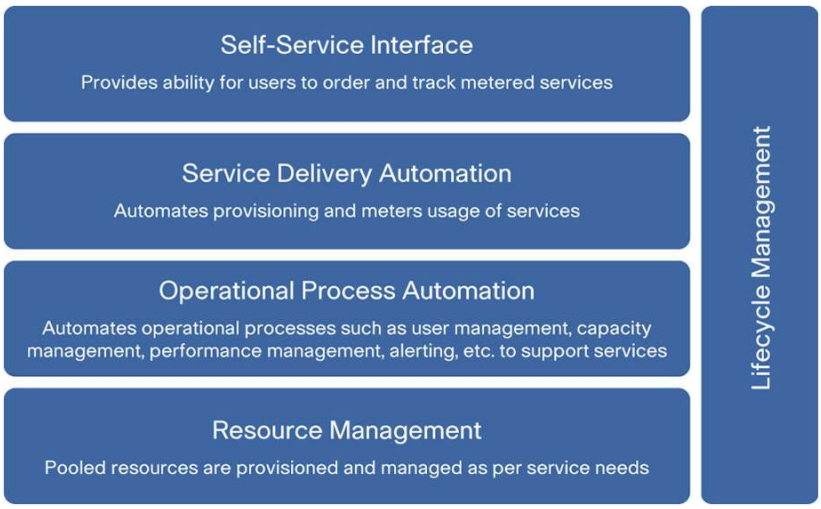
- Create a catalog of standardized service offerings with a self-service portal for users, implement policy-based controls, and manage the service lifecycle
- Automate and orchestrate operations, including service and infrastructure provisioning; service change management, metering, billing, and chargeback; and resource management across various aspects of the IT infrastructure, including compute, virtualization, network, storage, and applications

Cisco® Intelligent Automation for Cloud combines these capabilities to provide a single unified software solution that enterprises can use to make their cloud aspirations a reality. It complements the Cisco Unified Computing System™ (Cisco UCS™) as well as other Cisco products, services, and partner technology solutions in a heterogeneous IT environment.

Solution Overview

Cisco Intelligent Automation for Cloud is an advanced software stack for Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) clouds. This solution combines innovative industry-leading solutions for cloud services, unified computing, unified fabric, unified management, cloud-customer connection, and intelligent networks. It provides an essential platform for designing, deploying, and operating a cloud infrastructure, in private, public, hybrid, or virtual private models, as depicted in Figure 1.

Figure 1. Cloud Computing Solution Elements



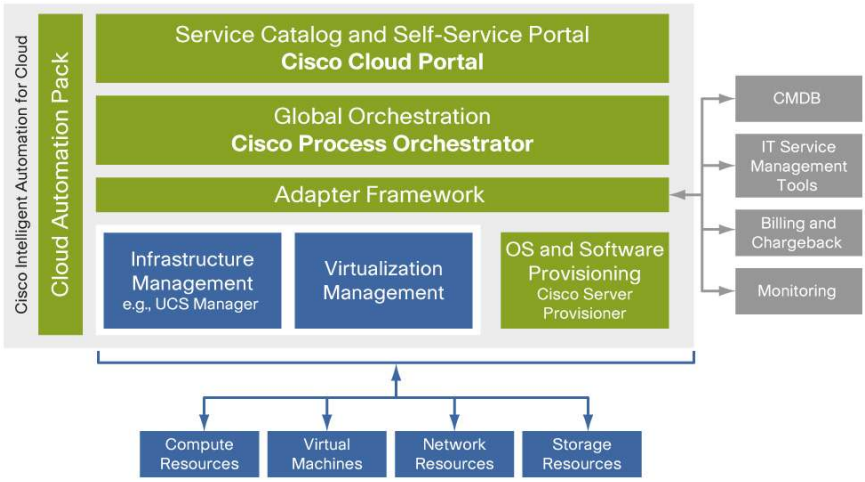
A cloud solution based on Cisco Intelligent Automation for Cloud includes the following.

- At a web-based **self-service interface**, users view service catalog options based on their roles, organization, and other access controls. Users can order services, provide configuration information through dynamic forms, and track and manage their services and usage on an ongoing basis. The catalog also helps IT to associate costs with various services, which can be integrated with billing and financial services for chargeback. The order process can also manage policies such as the lease period, so that services that are no longer needed can expire and the associated resources reclaimed for other uses.
- Orders that have been placed and approved go through **service delivery automation**, which orchestrates the provisioning and configuration steps across all the elements. These elements include resources to be provisioned (compute, virtualization, network, and storage), configuration updates to be made, software to be provisioned, and supporting services to be set up (firewalls, load balancing, and disaster recovery). Service information updates flow back to the web-based portal, as well as to system management tools such as ticketing systems and configuration management databases (CMDBs) that need to be updated.
- **Operational process automation** assists and coordinates the ongoing operational and support tasks for cloud management, including user management, performance management, alerting, service-level management, capacity planning, maintenance checks and procedures, and audit and compliance reporting.
- **Resource management** uses the resource pools to provision, manage, deprovision, and configure individual resources to complete resource-level operations. Requests are orchestrated to domain resource managers or managed internally. Through this approach, Cisco Intelligent Automation for Cloud orchestrates resource-level operations across compute resources such as Cisco UCS or other hardware; hypervisors such as VMware, Xen, or Hyper-V; storage resources such as EMC and NetApp; and network resources such as the Cisco Nexus® family.
- **Lifecycle management** involves creation and management of a service model, service definitions, and the underlying automation design for provisioning and managing each service. It also provides the ability to track all aspects of individual services that are running, including project and business information captured during the initial order as well as data about the various elements that were provisioned to support the service from initiation to retirement.

Solution Components

The solution is comprised of major interface and automation components (Figure 2).

Figure 2. Cisco Intelligent Automation for Cloud Solution Components

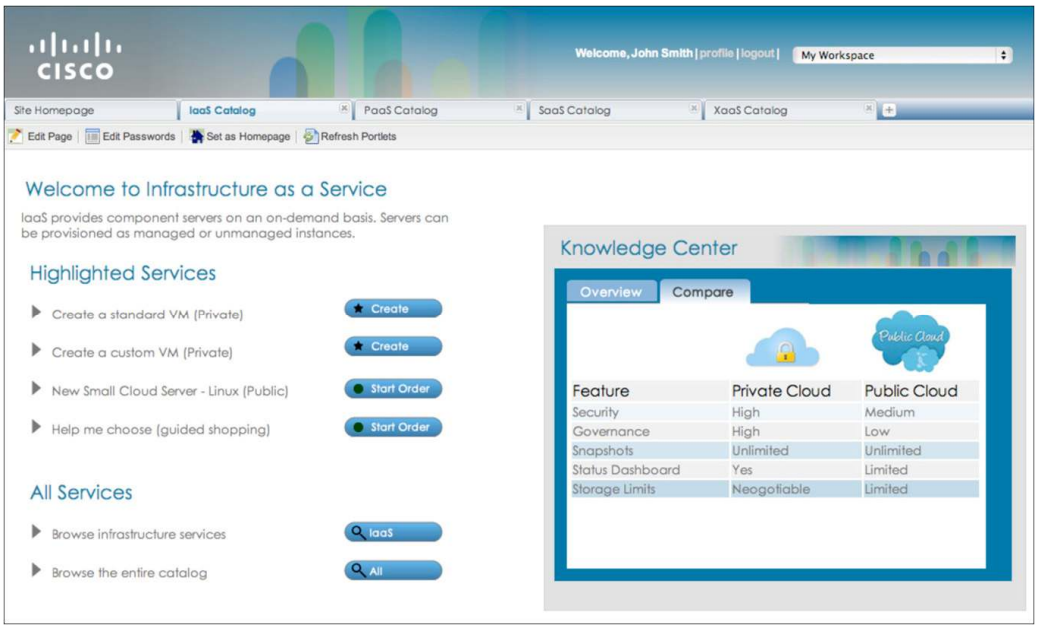


Cisco Intelligent Automation for Cloud provides an integrated stack of core solution elements: Cisco Cloud Portal, Cisco Process Orchestrator, Cisco Process Orchestrator Integration Framework, Cisco Server Provisioner, and Cloud Automation Packs.

Cisco Cloud Portal

With the acquisition of newScale, Cisco now offers Cisco Cloud Portal, a comprehensive service catalog with capabilities for service design and lifecycle management, a web-based self-service portal that allows users to order and manage services, and built-in policy enforcement and tracking (Figure 3). The portal has a configurable and brand able interface for different departments and roles (for example, consumers, IT administrators, and managers).

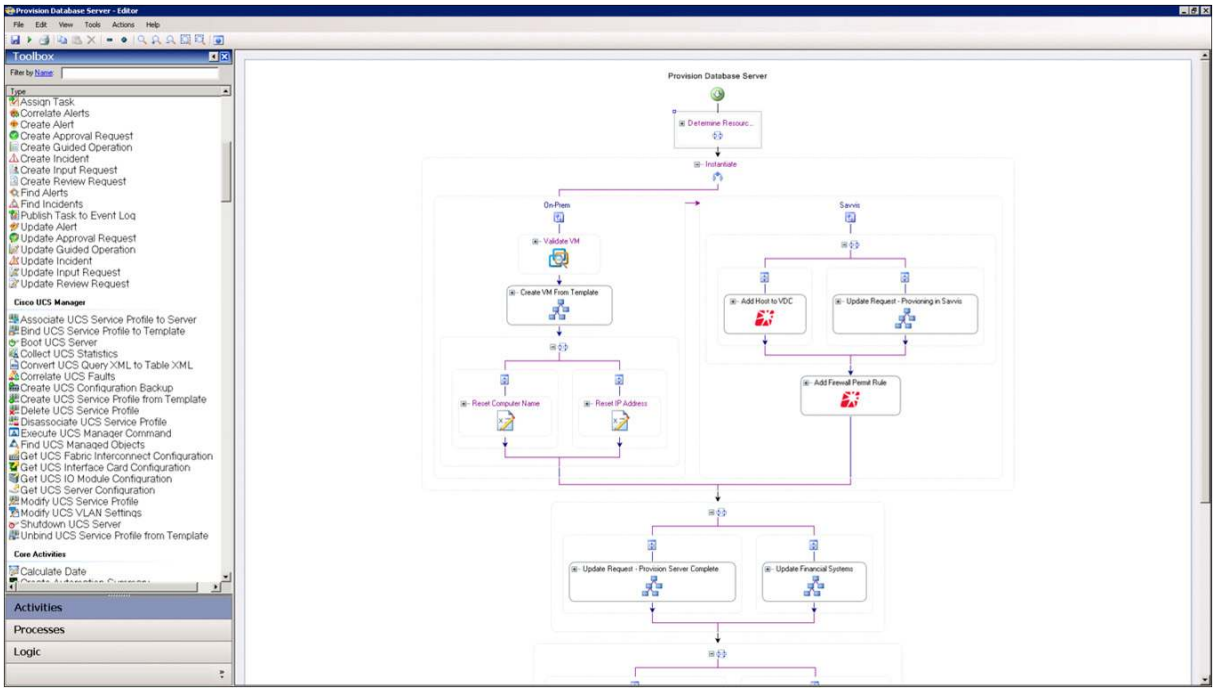
Figure 3. Cisco Cloud Portal Allows Self-Service Ordering from a Catalog of Standard Options



Cisco Process Orchestrator

Cisco Process Orchestrator is global orchestration engine for automation of order-to-delivery, service management, and assurance instantiation. This automation core includes a process orchestration engine, an interactive automation design studio, and a reporting and analytics module (Figure 4).

Figure 4. Cisco Process Orchestrator Automates Process Execution through Workflows



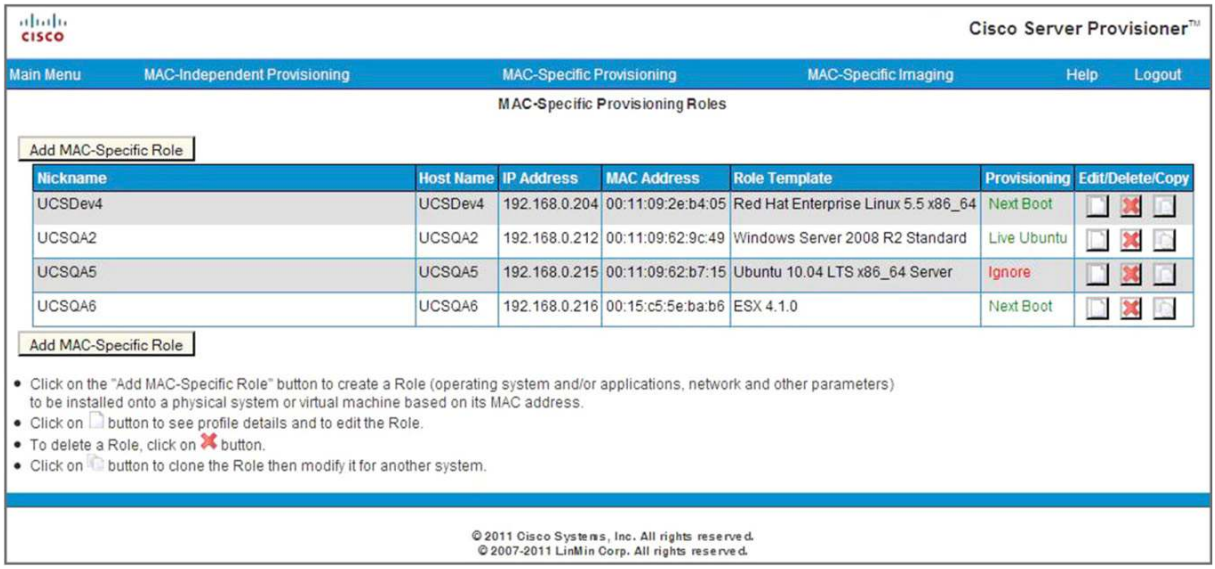
Cisco Process Orchestrator Integration Framework

The Cisco Process Orchestrator Integration Framework makes Cisco Intelligent Automation for Cloud easy to integrate with any data center element in the ecosystem. Using both standard connectivity and field-built integration, infrastructure elements and boundary IT service management tools are all connected into streamlined, comprehensive automated processes. An extensive set of available integrations covers Cisco UCS Manager; VMware; Remedy; SAP; Windows; Oracle DB; web services; network, storage, and server resources; Microsoft SCOM; and many more. In addition, the design studio facilitates field integration and automation through interfaces from command-line interface and web services (SOAP and REST), script support such as PERL and Powershell, database access, and SNMP integration. This is how any data center system or public cloud services can enter the fabric of automation.

Cisco Server Provisioner:

Cisco Server Provisioner is a software provisioning and imaging component for OS, hypervisor, and application provisioning to remote, unattended, native installations on virtual and physical servers (Figure 5).

Figure 5. Cisco Server Provisioner Automates the Provisioning of Operating Systems and Application Software



Cloud Automation Packs

Cloud Automation Packs are sets of preconfigured workflows for both common and complex computing tasks, including VMware task automation, Cisco UCS Manager task automation, Cisco Server Provisioner task automation, and automation of core and common activities that span multiple domains.

Benefits

- **Dramatically improves IT agility:** Business users order IT services through a self-service portal, eliminating back-and-forth information gathering sessions with IT. The end-to-end provisioning time for new services is reduced from weeks to minutes. This helps users to acquire infrastructure resources, deploy applications, and fulfill business needs more rapidly.
- **Increases employee productivity and promotes business-IT alignment:** Because Cisco Intelligent Automation for Cloud automates many manual processes, it dramatically improves productivity of IT staff and frees the staff to focus on new projects. This helps IT to be more responsive to business initiatives and improves business-IT alignment.
- **Keeps IT in control through standards and policies:** Automated and guided workflows promote the consistent implementation of best practices and policy-compliant processes. Approval steps can easily be built into the workflows, and detailed reporting and audit trails are generated. Because services are ordered for a specific period of time and provide visibility into associated costs through showback, chargeback, and billing integration, infrastructure sprawl is brought under control.
- **Maximizes asset utilization:** Because systems can be rapidly repurposed (reprovisioned or reimaged), idle systems can become a thing of the past. As soon as a customer (internal or external) no longer requires a system, it can be put back into the available pool, repurposed, and put to near-immediate use, increasing the use of capital equipment.

- **Promotes best practices and the reuse of IT intellectual capital:** The specialized knowledge of domain IT experts can be automated into workflows and system provisioning role templates, becoming reusable by any IT team across the entire organization. Consistent, automated implementation of best practices improves service levels, lowers the risk of errors, and improves consistency of data in the CMDB.
- **Creates an adaptable cloud:** Cisco Intelligent Automation for Cloud is designed to support an evolving set of cloud services. As enterprises add cloud services to the service catalog or modify them, the enterprises can add to and adapt the underlying automation through an easy-to-use interactive automation design studio. By using prepackaged automation packs and reusing existing pieces of automation, the time required to implement new services can be substantially reduced.
- **Works with existing infrastructure resources:** Cisco Intelligent Automation for Cloud is designed to work with both physical and virtual resources. It also works in heterogeneous environments and integrates with resources and system management tools from different vendors.

Primary Functions

Cisco Intelligent Automation for Cloud supports a broad spectrum of cloud management activities, from setup and design, ongoing service delivery, and system operations to management control points, reporting, and analytics.

Self-Service Interface

- **Ordering services:** End users can browse and search a web-based catalog of service options and request services through a simple self-service ordering process.
- **Managing services:** End users can track order status, modify and manage completed orders, and view usage, consumption, and costs for all their services.

Service Delivery Automation

- **Infrastructure orchestration:** Automated processes divide service requests into their components and orchestrate the provisioning and configuration of the underlying resources as well as OS and software.
- **Billing and chargeback:** Automated provisioning provides consumption tracking and integration into metering, chargeback, and billing systems.
- **Integration with CMDB and other systems management tools:** Automated processes keep CMDB and other system management tools updated as service changes are made. This integration can also use information from these tools as sources of data when appropriate.

Operational Process Automation

- **User and system administration:** This capability controls user identity, roles, and entitlements, keeping cloud tenants securely isolated from each other.
- **Alert and incident management:** Users can detect and manage system incidents, send alerts, and open support tickets.
- **Automation control center:** This console provides a single point for viewing and controlling automated processes.
- **Reporting:** Advanced reporting functionality allows all processes, results, and audits to be tracked and reported. It also provides built-in return on investment (ROI) and auditing models.
- **Compliance:** End users can track all activities and create detailed audit trails that can be used for compliance reporting.

Resource Management

- **Integration with resource managers:** This capability integrates with resource managers such as Cisco UCS Manager and VMware vCenter for provisioning of individual resource components.
- **Capacity management:** Automated capacity utilization checks, alerts, and trending reports provide proactive capacity management.
- **Maintenance and replacement of units:** An automated process evacuates resources for maintenance and replacement as required.
- **Usage and quota management:** Automated monitoring and metering of tenant accounts simplify usage and quota management.

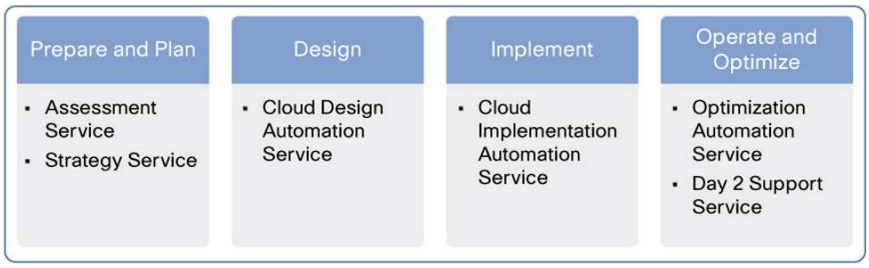
Lifecycle Management

- **Service definition:** New services can be defined using predefined templates. Service definitions include design descriptions, selection parameters, pricing options, and business and technical processing flows, all using a GUI.
- **Automation design:** Workflows can be created to automate all steps of the service lifecycle: service provisioning, decommissioning, modification, and upgrades. Workflows are created through a GUI. Both service definitions and automation designs can be modified easily with point-and-click tools, eliminating the need for time-consuming custom programming.
- **Visibility and control:** IT staff and users can track and manage the lifecycle of each service, from initial request to decommissioning. With this transparency, IT administrators can reduce the potential sprawl associated with cloud instances and virtual machines.

Deployment

Cisco Intelligent Automation for Cloud can be deployed as a comprehensive software solution together with a services engagement to assist with the preparation and planning, design, implementation, and optimization of cloud service offerings and delivery. The services engagement can also involve development of a cloud strategy and creation of corresponding automation workflows along with the software, or focus on basic implementation service capabilities for the software deployment (Figure 6).

Figure 6. Cisco Intelligent Automation for Cloud: Enablement Service Capabilities



For More Information

To learn more about Cisco Intelligent Automation for Cloud, please visit http://cisco.com/go/iacloud.

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