

Introduction

NetIQ Cloud Manager 2.1.1

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About This Guide

This guide introduces concepts and terminology required to successfully install and configure NetIQ Cloud Manager 2.1.1. It includes the following sections:

- ♦ [Chapter 1, “What Cloud Manager Does,” on page 7](#)
- ♦ [Chapter 2, “The Cloud Manager Components,” on page 11](#)
- ♦ [Chapter 3, “The Cloud Environment,” on page 13](#)
- ♦ [Chapter 4, “Terminology,” on page 19](#)

Audience

This information is intended for anyone who needs to familiarize themselves with NetIQ Cloud Manager in order to install, configure, maintain, or use the product. Consumers of this information should be experienced Linux and Windows system administrators who are familiar with virtual machine technology and datacenter operations.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation.

Additional Documentation

For other NetIQ Cloud Manager 2.x documentation, see the [NetIQ Cloud Manager 2.x documentation site](http://www.novell.com/documentation/cloudmanager2) (<http://www.novell.com/documentation/cloudmanager2>).

1 What Cloud Manager Does

NetIQ Cloud Manager, a WorkloadIQ product from NetIQ, transforms your virtual infrastructure into a true Cloud environment. Built to operate with your existing VMware, Citrix XenServer, Microsoft Hyper-V, SUSE Xen, or Linux Kernel-based Virtual Machine (KVM) virtual hosts, Cloud Manager accelerates delivery of services through on-demand requesting of *workloads* and automated provisioning of the workloads.

Whether you are an private or public service provider, your customers demand timely access to the computing resources needed to run their businesses. Even with a virtual infrastructure in place, providing new services to customers can require you to research the requirements, create or customize the appropriate virtual machines, and then deploy the virtual machines accordingly, all of which can exhaust valuable time and effort.

Cloud Manager lets you expose your virtual computing resources in a manner that enables your customers to easily consume them for business services and you to deliver the services efficiently, automatically, and on time.

The following sections explain what Cloud Manager does to transform your virtual infrastructure into flexible, reliable, and secure Cloud environment:

- ◆ [Section 1.1, “Provides Multi-Tenancy,” on page 7](#)
- ◆ [Section 1.2, “Organizes and Monitors Resources,” on page 8](#)
- ◆ [Section 1.3, “Provides a Catalog for Building Business Services,” on page 8](#)
- ◆ [Section 1.4, “Customizes Service Offerings for Organizations,” on page 8](#)
- ◆ [Section 1.5, “Exposes Business Service Costs,” on page 9](#)

1.1 Provides Multi-Tenancy

Cloud Manager enables you to provide Cloud services to multiple tenants, referred to as *organizations*, at one time. As the service provider, you assign the resources that an organization can use for its business services. These resources might be dedicated to a single organization or shared among multiple organizations, depending on your business model and customer requirements.

Within an organization, members of the organization are assigned *roles* that let them control and monitor the deployment of business services for their organization. Some members might have rights to request business services, some to approve or deny business service requests, some to control organization membership, and some to create business groups (organization subunits) and allocate organization resources to the business groups.

Depending on the scope of your Cloud services, an organization can represent different units. For example, if you are a public service provider, each organization would most likely represent a company. However, if you are an enterprise IT department, an organization might represent your company or a single department or cost center within your company.

1.2 Organizes and Monitors Resources

One of the more difficult management activities involved with providing Cloud services to multiple organizations is ensuring that each organization has access to only the resources that it should. To alleviate this problem, Cloud Manager enables you to group resources and assign the resource groups to the appropriate organizations. When an organization creates a business service, the business service is deployed to a resource group assigned to the organization.

A *resource group* is a collection of hosts or clusters and their associated resources (CPUs, memory, networks, and storage). In VMware vSphere environments, a resource group can also be a resource pool.

You can have both dedicated and shared resource groups. A dedicated resource group services only one organization, while a shared resource group services more than one organization.

Cloud Manager also monitors resource utilization for the entire system and for individual organizations. By comparing used resources against resource capacity, you can ensure that your overall system and each individual organization has sufficient resources

1.3 Provides a Catalog for Building Business Services

Most customers don't want to concern themselves with the details of your virtual infrastructure. All they really want is to run their business services and to know that they are receiving the level of support needed for those services.

Cloud Manager removes all customer interaction with your virtual infrastructure through the use of a catalog. The catalog consists of *workload templates* and *service levels* that you create and make available to the customer.

- ♦ **Workload templates:** A *business service* can have one or more workloads (virtual machines). The workloads are created from workload templates the customer selects from the catalog. The workload template identifies a virtual machine and the amount of resources (virtual CPUs, memory, networks, and disk space) it needs to run.
- ♦ **Service levels:** A service level associates a business service workload with 1) the resource group where it will be deployed, 2) the support objectives (such as availability, response time, and quality), and 3) the cost of the resources and support. The customer selects a service level for each workload in the business service.

When a customer needs a new business service, he or she creates the business service workloads from the workload templates you've made available and selects the service level for each of the workloads. They don't need to know anything about the virtual infrastructure to successfully deploy their business service.

1.4 Customizes Service Offerings for Organizations

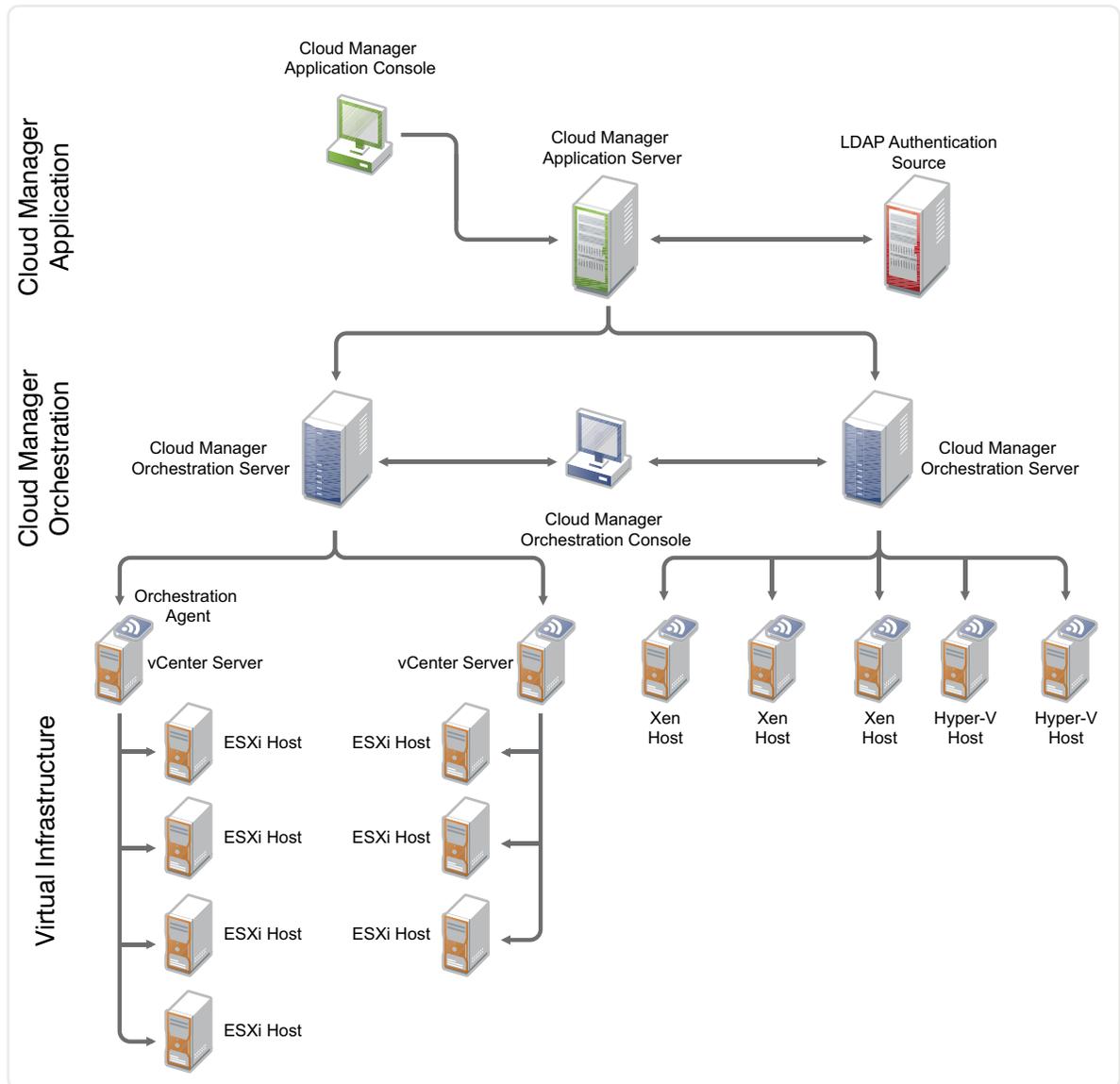
Not all organizations need the same types of business services. Cloud Manager lets you customize your service offerings for each organization by determining which workload templates and service levels are available to an organization. While your catalog might contain hundreds of workload templates and service levels, you can assign only the ones needed by an organization.

1.5 Exposes Business Service Costs

You can assign costs to the various components associated with a business service. This includes a workload's setup and license costs, its resource costs, and its support costs. The total monthly cost for the business service is available to the customer before requesting the service and is also available through cost reports.

2 The Cloud Manager Components

Cloud Manager consists of two main components: the Cloud Manager Application Server and the Cloud Manager Orchestration Server. The Cloud Manager Application Server and the Cloud Manager Orchestration Server sit on top of your virtual infrastructure to automate Cloud services for your customers.



Cloud Manager Application Server

The Cloud Manager Application Server provides the portal for initiating and managing business services. When a customer requests a business service through the Application Console, the Application Server sends instructions that the Orchestration Server uses to provision the service's workloads (virtual machines) through the virtual infrastructure technologies.

- ♦ **Application Console:** A Web application that can be run on any computer with a supported Web browser. The console is for both Cloud Manager administrators and users. Cloud Manager administrators use the console to organize computing resources so that users can consume them as business services. Users access the console to request and manage business services. Login to the console occurs through an LDAP directory designated as the authentication source.
- ♦ **Application Server:** Supports the Application Console and communicates with Orchestration Servers to provide instructions for deploying, managing, and removing business service workloads. It also performs user authentication with the LDAP source.

Cloud Manager Orchestration Server

The Cloud Manager Orchestration Server automates the creation and management of business service workloads in the virtual infrastructure. When the Orchestration Server receives a business service request from the Application Server, the Orchestration Server directs the creation of the service's workloads from the appropriate VM template and the deployment of the workloads to the appropriate VM host. In addition, Cloud Manager Orchestration Server discovers and surfaces your virtual infrastructure resources (hypervisor technologies, VM hosts, VM templates, and so forth) in the Cloud Manager Application Console so that you can organize them into the catalog components that customers use to build their business services.

- ♦ **Orchestration Server:** Receives workload instructions from the Application Server and directs the creation and management of those workloads by the virtual infrastructure. Depending on the size of your virtual infrastructure, you might have one or many Orchestration Servers.
- ♦ **Cloud Manager Orchestration Console:** Monitors and manages the activity of the Orchestration Servers, enabling you to view and troubleshoot jobs associated with workload creation and management.
- ♦ **Cloud Manager Orchestration Agent:** Provides communication between the Orchestration Server and the VM hosts managed by the server. The hypervisor technology (vSphere, Citrix Xen, Hyper-V, SUSE Xen, and KVM) determine where the agent is installed.

Virtual Infrastructure

The virtual infrastructure forms the foundation of the Cloud Manager physical topology. The hypervisor technologies (VMware, Citrix XenServer, Microsoft Hyper-V, SUSE Xen, and KVM) virtualize the underlying physical resources and enable the creation and management of virtual machines.

The virtual infrastructure components are dependent on the hypervisor technology. The illustration shown above does not represent all components of the virtual infrastructure (such as networks, storage, virtual machines, and so forth). It is intended simply to show how the Cloud Manager components sit on top of your virtual infrastructure and interact with it to provide cloud services. The Cloud Manager documentation assumes that the person who will implement Cloud Manager is knowledgeable about your virtual infrastructure components and management. Refer to your hypervisor documentation for information.

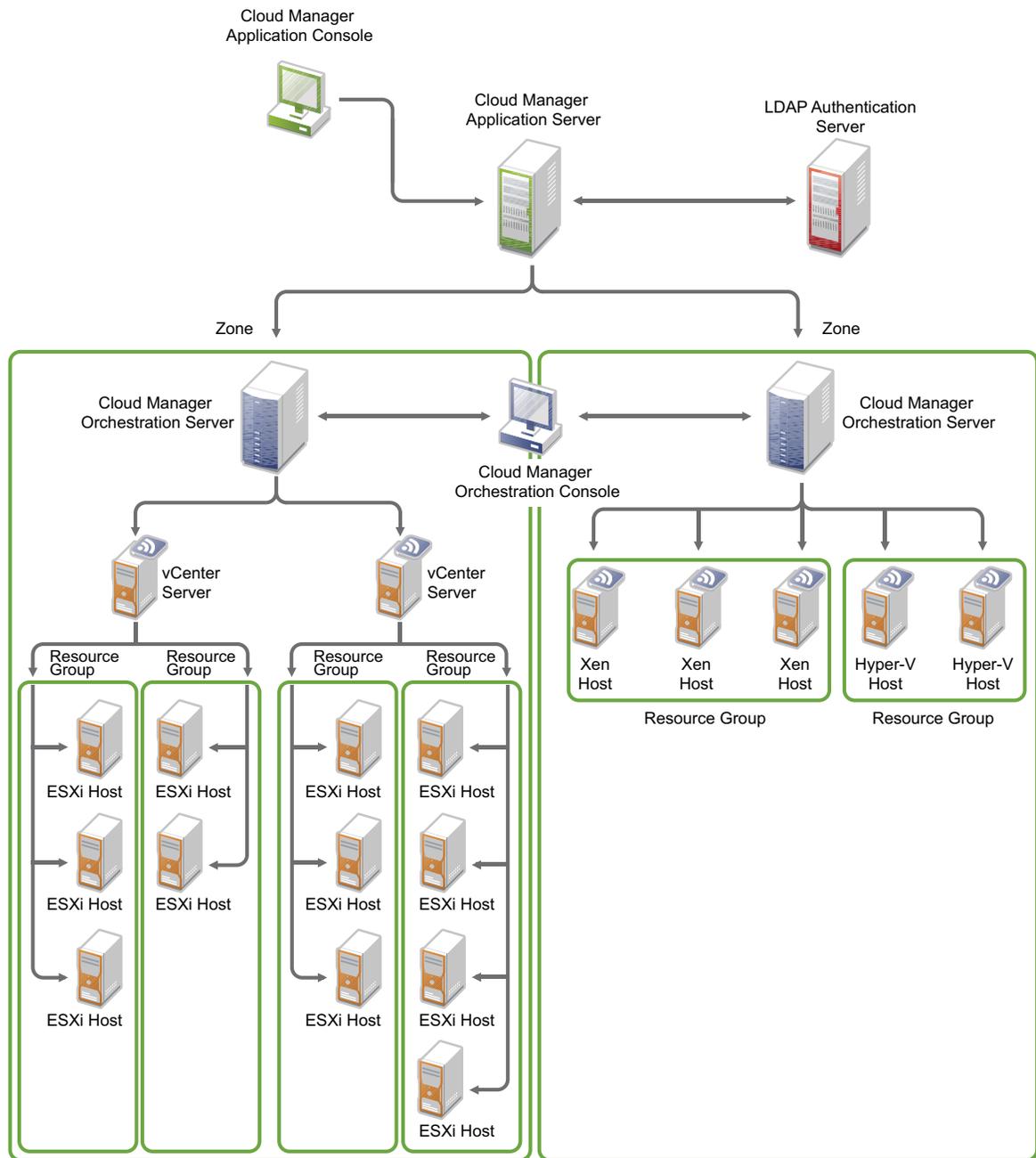
3 The Cloud Environment

Cloud Manager turns your virtual infrastructure into a Cloud environment that provides automated business services to your customers. The Cloud environment consists of a variety of components. Some of the components, such as *zones* and *resource groups*, provide ways to organize your virtual infrastructure resources so that Cloud Manager knows where to run business services. These components are mostly hidden to users. Other components, such as *service levels* and *workload templates*, form the core of business services and are readily visible to users. The following sections introduce these key components:

- ♦ [Section 3.1, “Zones and Resource Groups,” on page 13](#)
- ♦ [Section 3.2, “Workload Templates,” on page 15](#)
- ♦ [Section 3.3, “Service Levels,” on page 16](#)
- ♦ [Section 3.4, “Organizations and Business Groups,” on page 17](#)

3.1 Zones and Resource Groups

A Cloud Manager zone is an Orchestration Server and its managed resources (hosts, clusters, resource pools, networks, storage, and so forth). Within a zone, these resources are organized into resource groups, as shown in the following illustration.



A resource group identifies a collection of hosts (and their associated networks and storage). When a workload is deployed, it is assigned to the resource group and provisioned using any of the resources within the group.

A resource group has the following characteristics:

- Supports only one hypervisor (VMware vSphere, Citrix XenServer, Microsoft Hyper-V, SUSE Xen, and KVM).
- Can include standalone hosts and clusters. Optionally, a resource group can be a vSphere resource pool. All host or pool resources (CPUs, memory, networks, disks, and so forth) should provide the same performance level so that a workload can run equally well on any of the resources.

- ♦ Cannot span zones. All resources in the group must reside in the same zone.
- ♦ Cannot share storage repositories with other resource groups.

As an example, you might form a Business Critical resource group that consists of high-performance vSphere hosts intended for critical production workloads. At the same time, you might have a Lab resource group that consists of standard-performance SUSE Xen hosts intended for non-production workloads.

3.2 Workload Templates

Workload templates are used to create business service workloads. A workload template defines the following:

- ♦ The VM template used to create the workload.
- ♦ Resource customizations to apply to the workload. For example, if the VM template provides 2 CPUs, you can increase that number to 4 CPUs.
- ♦ The license and setup costs associated with a workload created from the template.

You create a catalog of workload templates from which users can choose when requesting business services. Depending on the needs of your users, you might have many workload templates. The examples in the following illustration are based on workload operating system, but you might have workload templates that provide not only the operating system but also applications or other services.



Windows Server 2008 64-bit

VM Template: WinServer2008_64
 Operating System: Microsoft Windows Server
 2008 64-bit
 Hypervisor: Hyper-V
 CPUs: 2
 Memory: 4 GB
 NICs: 2
 Additional Disks: 2 (800 GB)



Windows Server 2003 32-bit

VM Template: WinServer2003_32
 Operating System: Microsoft Windows Server
 2003 32-bit
 Hypervisor: VMWare
 CPUs: 4
 Memory: 12 GB
 NICs: 4
 Additional Disks: 2 (2000 GB)



SUSE Linux Enterprise Server 10 64-bit

VM Template: SLES10_64
 Operating System: SUSE Linux Enterprise Server
 10 SP2 64-bit
 Hypervisor: Xen
 CPUs: 4
 Memory: 8 GB
 NICs: 3
 Additional Disks: 3 (1500 GB)

3.3 Service Levels

Service levels are associated with resource groups. They determine how much it costs to run business service workloads on the resources (vCPUs, memory, networks, and storage). They can also include performance expectations for those resources as well as the level of IT support provided for workloads running. The performance and support expectations, referred to as service level objectives, can also have costs associated with them.

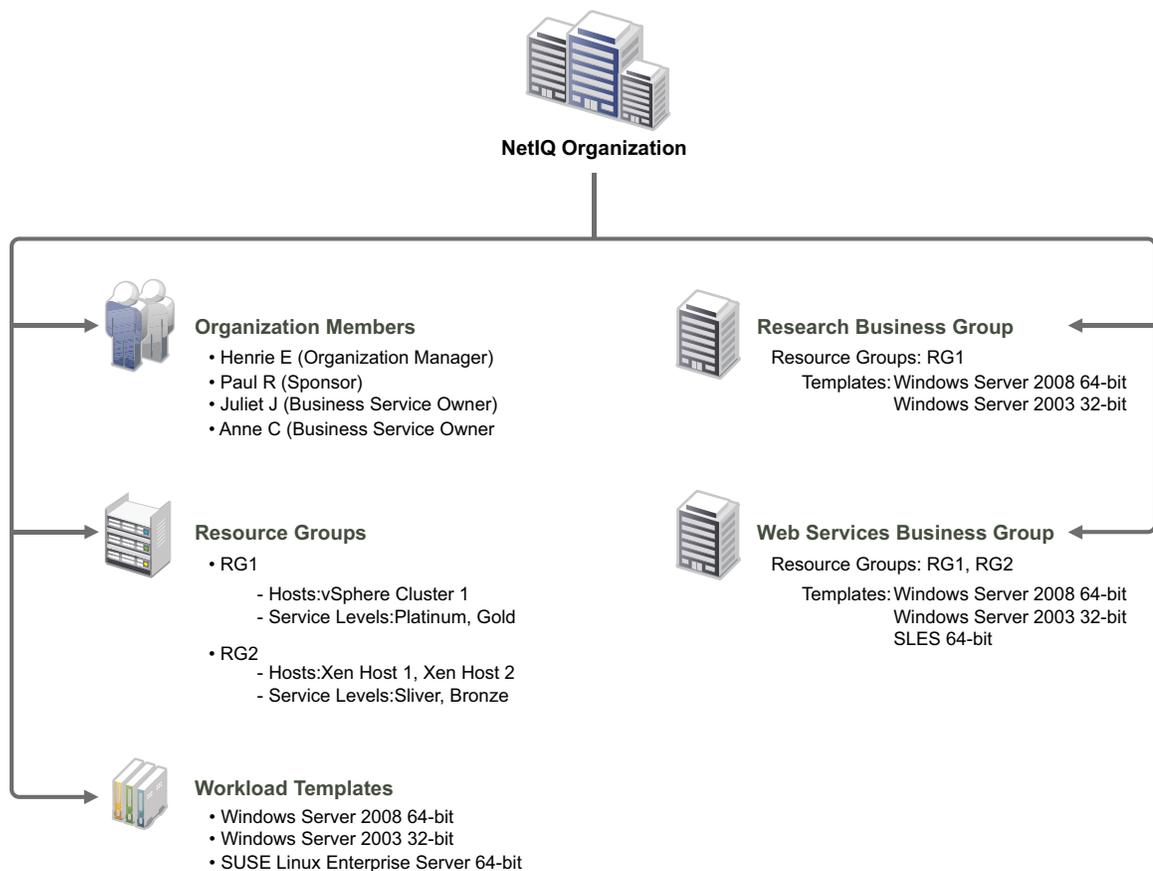
Consider the following service levels:

|  Platinum Service Level |  Gold Service Level |  Bronze Service Level |
|---|---|---|
| Resource Group: Business Critical Resource Cost: \$1500 per month | Resource Group: Business Standard Resource Cost: \$1000 per month | Resource Group: Non Production Resource Cost: \$ 500 per month |
| Objectives: 99% availability 2 hour response time | Objectives: 98% availability 8 hour response time | Objectives: 97% availability 24 hour response time |
| Objectives Cost: \$ 2000 per month | Objectives Cost: \$1200 per month | Objectives Cost: \$ 600 per month |

The Platinum service level runs workloads in the Business Critical resource group and sets service objectives of 99% availability and 2 hour response time for support issues. It has the highest resource cost and objectives cost. The other two service levels provide slightly lower resource quality and service objectives for the workloads at a lesser cost.

3.4 Organizations and Business Groups

An organization represents a tenant for which you are providing Cloud services. A business group is a subunit within the organization for which business services are deployed. An organization must have at least one business group. Typically, an organization represents a company and business groups represent the departments or cost centers that need to deploy business services.



To provide organizations with the resources needed to deploy business services, resource groups and workload templates are assigned to organizations. In the above illustration, two resource groups (RG1 and RG2) and three workload templates (Windows Server 2008 64-bit, Windows Server 2003 32-bit, and SUSE Linux Enterprise Server 64-bit) are assigned to the NetIQ organization.

Because an organization's business groups might not need access to the same resources and workload templates, the organization's resources and workload templates must be assigned to the business units. In the above illustration, the organization has two business groups (Research and Web Services). Both resource groups and all three workload templates are assigned to the Web Services business group to be used for its business services, but only one resource group and two templates are assigned to the Research business group for its business services.

Users are added as organization members and given roles within the organization. A role provides rights to perform specific activities, such as deploying business services or managing the organization's membership. In the above illustration, both Juliet J and Anne C have the Business Service Owner role for the organization. This allows them to create business services for both the Research and Web Services business groups. It is also possible to assign a user a role at the business group level rather than at the organization level. For example, if Juliet J was assigned the Business Service Owner role for the Research business group rather than for the organization, she could create business services only for the Research business group.

4 Terminology

Approver

A Cloud Manager role that provides Application Console rights to approve or deny business service requests based on available resource capacity for an organization or zone.

Build Administrator

A Cloud Manager role that provides Application Console rights to complete pre-build and post-build configuration for workloads in requested business services.

Business Group

A subunit of an organization. A business group can be assigned all or some of the organization's resources (such as its hosts, templates, and networks) to use for deploying business services.

A business group might represent a cost center or a department that needs to deploy business services.

When organization members are associated to one or more business groups, they are assigned rights to use the resources that the business groups provides. For example, an organization member might be assigned as a Business Service Owner or Sponsor for a specific business group.

Business Group Viewer

A Cloud Manager role that provides Application Console rights to view business services for a business group.

Business Service

A collection of workloads that are deployed together.

Business Service Owner

A Cloud Manager role that provides Application Console rights to create, modify, and delete business services for an organization or for specific business groups within an organization.

Catalog Manager

A Cloud Manager role that provides Application Console rights to create, modify, and delete workload templates.

Cloud Administrator

A Cloud Manager role that provides Application Console rights to perform all tasks.

Cloud Manager Application Console

A Web application that can be run on any computer with a supported Web browser. The console is for both Cloud Manager administrators and users. Cloud Manager administrators use the console to organize computing resources so that users can consume them as business services. Users access the console to request and manage business services. Login to the console occurs through an LDAP directory designated as the authentication source.

Cloud Manager Application Server

The server component that supports the Cloud Manager Application Console and communicates with Cloud Manager Orchestration Servers to provide instructions for deploying, managing, and removing business service workloads. It also performs user authentication with the LDAP source.

Cloud Manager Orchestration Agent

A client component installed on VM hosts to enable them to be managed by a Cloud Manager Orchestration Server. The hypervisor technology (VMware vSphere, Citrix XenServer, Microsoft Hyper-V, SUSE Xen, and Linux Kernel-based Virtual Machine (KVM)) determine where the agent is installed.

Cloud Manager Orchestration Console

The administrative interface for the Cloud Manager Orchestration Server. The console monitors and manages the activity of the Orchestration Servers, enabling you to view and troubleshoot jobs associated with workload creation and management.

Cloud Manager Orchestration Server

The server component that receives workload instructions from the Cloud Manager Application Server and directs the creation and management of those workloads by the virtual infrastructure. Depending on the size of your virtual infrastructure, you might have one or many Orchestration Servers.

Host

A computer (that is, a physical machine) that hosts one or more virtual machines (VM).

Organization

A tenant for which you are providing Cloud services. You assign resources to the organization that it can use for deploying business services.

An organization includes users (referred to as “members”) who serve in roles within the organization. These roles facilitate the management of business services and the management of the organization. A user can belong to only one organization.

An organization typically represents a company. In the case of a private service provider or enterprise IT department, an organization could represent small company units such as business units, cost centers, and departments.

Organization Manager

A Cloud Manager role that provides Application Console rights to manage users, role assignments, resource assignments, and business services within an assigned organization.

Resource Group

A collection of hosts or clusters and their associated resources (CPUs, memory, networks, and storage). In VMware vSphere environments, a resource group can also be a resource pool.

You can have both dedicated and shared resource groups. A dedicated resource group services only one organization, while a shared resource group services more than one organization.

Role

A set of rights that allows a user to perform specific activities in the Cloud Manager Application Console.

Service Level

A service level defines resource costs (vCPUs, memory, networks, and storage) for a business service. If desired, it can also define service objectives relating to such items as business service uptime, computing performance, or support availability. Any cost associated with an objective becomes part of the service level cost.

Service Level Objective

A measurable objective such as business service uptime, support availability, or support response time. Each objective can have a cost associated with it. When added to a service level, the objective's cost becomes part of the service level cost.

Sponsor

A Cloud Manager Application Console role that provides rights to approve or deny business service requests based on an organization's financial policies.

Workload

A virtual machine.

Workload Template

A template used to create a workload. The template defines the VM template from which the workload is created and allows for customizing of the VM template settings to increase or decrease the resources (vCPUs, memory, disk storage, and networks) required for the workload.

Zone

A Cloud Manager Orchestration Server and its managed resources (VM hosts, VM templates, and so on). The Cloud Manager Orchestration Console might also refer to this as a “grid.”

Zone Administrator

A Cloud Manager Application Console role that provides rights to manage the resources for one or more assigned zones.