

Design Strategy

Abiquo was specifically designed to meet business needs. Unlike other Cloud products that were built as tactical solutions to support a specific hypervisor technology, Abiquo was developed from a strategic top-down perspective, to allow customer environments to both fully deliver on the promises of virtualization, and to transition geographically disparate datacenter installations and third party hosted resources, into a fully managed enterprise cloud operating at global scale.

The Problem

The way in which IT organizations are run has fundamentally changed very little in the last thirty years. Although virtualization was a great advance in technology, the promises of improved utilization, efficiency, and energy savings have yet to be fully realized because virtualization is still largely a manual process.

Though providing many benefits in areas such as resilience and portability, virtualization has significantly amplified complexity; many organizations are now finding it increasingly difficult to manage. The IT infrastructure organization continues to spend much of its time provisioning virtual resources manually, which is highly inefficient and prevents many virtualization goals from being reached, as well creating security, compliance, and governance nightmares.

The deployment of a virtual resource can be a highly complex process. The machine must be suitably configured and there must be enough free resources available, but on which machine (among hundreds or even thousands) can the virtual resource most efficiently be placed to meet optimization and energy-saving needs? Now consider requirements for performance, co-location and resilience. These decisions must be made accurately each and every time a virtual resource is deployed, otherwise we will not achieve optimal efficiency, nor cost savings. More worryingly, serious security, governance and compliance violations will inevitably occur.

These decisions are beyond the reasonable capacity of humans to make in all but the smallest environments. In order to solve this problem, the IT organization must make fundamental changes.

The Resource Cloud

With Abiquo, the provision of physical infrastructure is completely separated from the virtual application infrastructure by a "Resource Cloud". Physical infrastructure, managed by the IT infrastructure organization, contributes resources to the Resource Cloud, while Virtual Enterprises (containing Virtual Datacenters, virtual machines and Virtual Appliances) consume it. Resources include CPU, memory, storage and connectivity. The first fundamental change is that the IT infrastructure organization delegates management of the Virtual Enterprises. It simply creates a Virtual Enterprise, assigns someone to administer it, and sets limits as to the resources that may be consumed. All of this takes less than a minute. In enterprise environments, administrators are typically IT professionals managing a given application. In the case of managed service providers, administrators are the MSP's customers, each allocated their own virtual enterprise.

Business Policies

The second fundamental change is that the decision as to where a virtual resource is deployed (i.e. the actual phys-

ical machine on which it will run) is determined entirely automatically, according to policy. Automation ensures that all factors will absolutely be considered and enforced; a human being no longer makes each decision. In fact, neither the Virtual Enterprise administrator, nor any other consumer of the Resource Cloud need know where the virtual resource is actually running, so long as deployment has occurred according to policy, they don't care.

Policy governs obvious rules like "don't try to run this workload on a server that has insufficient capacity or the wrong hypervisor."

Business policies take this automation to the next level, enabling the CIO to set rules for security, compliance, energy costs, utilization, load balancing and more. For example, financial institutions are required to ensure that their research departments do not share physical hardware with their investment arms. By setting a single policy, the CIO can determine that virtual resource from one can never be deployed on a machine hosting the other.

Policy-based deployment empowers IT, gives the CIO organization control and improves overall infrastructure efficiency.

Elasticity

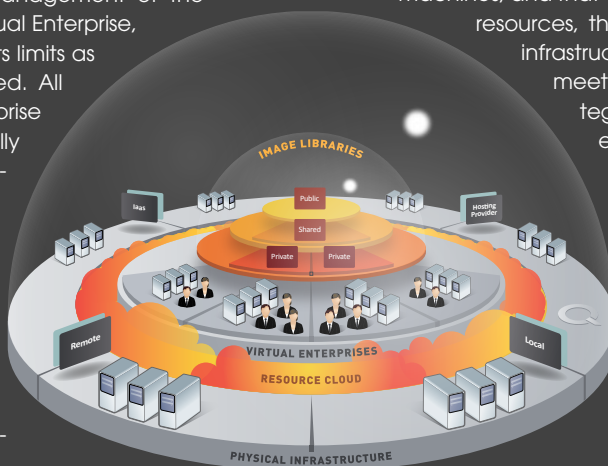
Physical resources can be provided by a local datacenter, remote datacenters owned by the organization (together a private cloud) or by third party providers (hybrid and public cloud). Most customers start by moving from traditional virtualized environments to a private cloud, knowing that they can seamlessly add third party resources at a later stage. The IT infrastructure organization has full control of resources. Business policy allows third party resources to be consumed in safety, and in line with suitable security, taking advantage of standards as they evolve.

Libraries Manage Virtual Machine Images

Where permitted by role, users can capture and store virtual machine images in private, shared or even public libraries. They can combine sets of VM images into a single appliance for easy re-deployment. Shared libraries allow the IT organization to define standard VM images, for example built to company anti-virus, directory and control requirements. Public VM images from reputable vendors can be downloaded for rapid deployment of complex systems, dramatically reducing implementation and evaluation times.

Benefits

Abiquo substantially reduces the load on the IT infrastructure organization, by delegating responsibility for Virtual Enterprise management. Given that Virtual Enterprise users don't have direct access to physical machines, and that Virtual Enterprises cannot exceed allocated resources, there is no danger in this delegation. The IT infrastructure organization can rest easy, focus on meeting service levels, and to take a more strategic, rather than tactical, approach. Virtual enterprise administrators are empowered to create their own Virtual Datacenters and to assign appropriate roles and responsibilities to other users to run them. This dramatically reduces the time taken to provision new servers and deploy new applications, allowing short term projects and flexibility that is unrealistic in current IT environments. Finally, organizations of all sizes benefit from increased efficiency, business agility and lower costs.



Product

Overview

Abiquo is the most complete and advanced enterprise cloud management solution available on the market today. It provides class-leading features like virtual to virtual conversion through a platform that is easy to implement and operate, liberating your IT organization from the drudgery of managing thousands of virtual machines, without relinquishing control of the physical infrastructure.

By combining global resources (local, remote and hosted) Abiquo can be used to create private, hybrid and public clouds of unlimited complexity, all managed through a single pane of glass. Abiquo is the only globally scalable cloud management solution available today.

Abiquo empowers authorized users and groups, by allowing them to manage their own Virtual Enterprises within allocated resource limits.

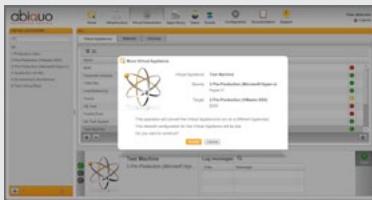
New virtual machines or pre-built appliances can be deployed in seconds, dramatically improving efficiency and allowing you to regain business agility.

Hypervisor Independence

Abiquo not only fully supports all major hypervisors simultaneously, it allows conversion of virtual machines from one hypervisor to another in any combination, completely eliminating vendor lock-in with a single drag and drop operation.

Supported hypervisors include:

- VMware ESX and ESXi
- Microsoft Hyper-V
- Citrix XenServer
- Virtual Box
- Xen Community
- KVM



Multi-tenancy with Delegated Control

Abiquo provides full multi-tenancy with full isolation, whether to internal groups or to external customers. A user's view is limited to the hierarchy below them. A single, Web-based management console is sensitive to the role and permissions of the relevant user.

Autonomous Virtual Enterprises

Abiquo empowers application teams and customers through Virtual Enterprises (VEs) which provide unlimited flexibility. Abiquo enables pass through control of the organizational hierarchy, an essential element for eliminating "virtual sprawl." VE Administrators create multiple Virtual Datacenters and appoint managers. Each Virtual Datacenter is a fully isolated instance, operating just like a physical datacenter, without the need to maintain equipment.

Managers can create Virtual Appliances and deploy virtual machines and storage in seconds. Each VE manages its own role-based user group and operates within strictly enforced resource limits. VE users are fully isolated from physical hardware, allowing risk-free, self-service provisioning and management.

Enhanced Security and Compliance

Business policies ensure that rules and regulations are automatically enforced across the infrastructure. Abiquo gives IT enhanced visibility into both physical and virtual infrastructures and will only allow resources to be deployed according to policies set by the organization, typically at CIO level. Deployment happens automatically, so the compliance committee does not have to review every new virtual machine.

Resource Limits

Resource limits, such as CPU cores, memory, storage, public IP ad-

resses and VLANs can be set by the IT infrastructure team for each Virtual Enterprise, and by Virtual Enterprise administrators for each Virtual Datacenter. Both hard (enforced) and soft (warning) levels are supported for each. This ensures that there is no danger of users exceeding the capabilities of the physical infrastructure.

Deep Hypervisor Integration

Abiquo works in conjunction with hypervisor management tools, such as VMware's vCenter, to manage VMs and share resources. Abiquo fully co-exists with VMs managed by any third party tool, providing bi-directional event driven integration to maintain synchronization. For example, if a third party management tool executes a live VM move, status is immediately and automatically updated. This applies whether or not the VM is managed by Abiquo for totally seamless operation.

Network, Storage Management

Network resources, such as public and private IP addresses from one or more defined pools can be automatically allocated to Virtual Appliances. Define a practically unlimited number of VLANs, Virtual NICs, private and public networks with your own numbering system.

Abiquo supports storage resources from a wide variety of standards and vendors.

Multiple Image Libraries

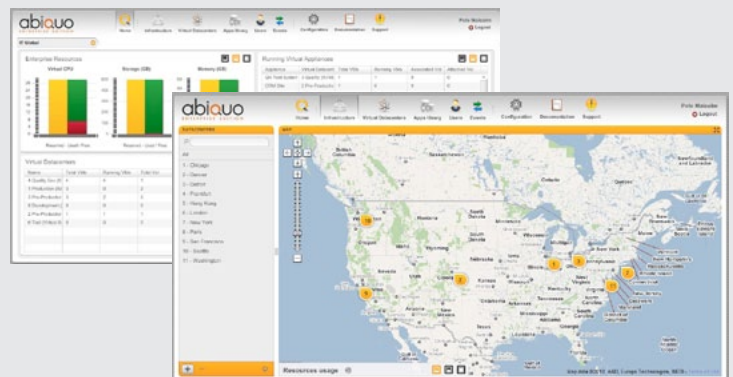
Abiquo supports public, shared and private libraries. Where permitted by role, users can capture stateful machine images, and even combine sets of VM images into a single appliance for easy re-deployment. Shared libraries allow the IT organization to define standard VM images. Public VM images from reputable vendors can be downloaded for rapid deployment of complex systems, dramatically reducing implementation and evaluation times.

Simplicity of Installation

Abiquo can be fully installed on a live running system, with no requirement to re-start or re-provision. It performs discovery and automatic inventory of multiple hypervisor host servers in a single pass, identifying existing running VMs, which can be progressively brought under Abiquo's management at any desired pace - or left under the control of third party tools.

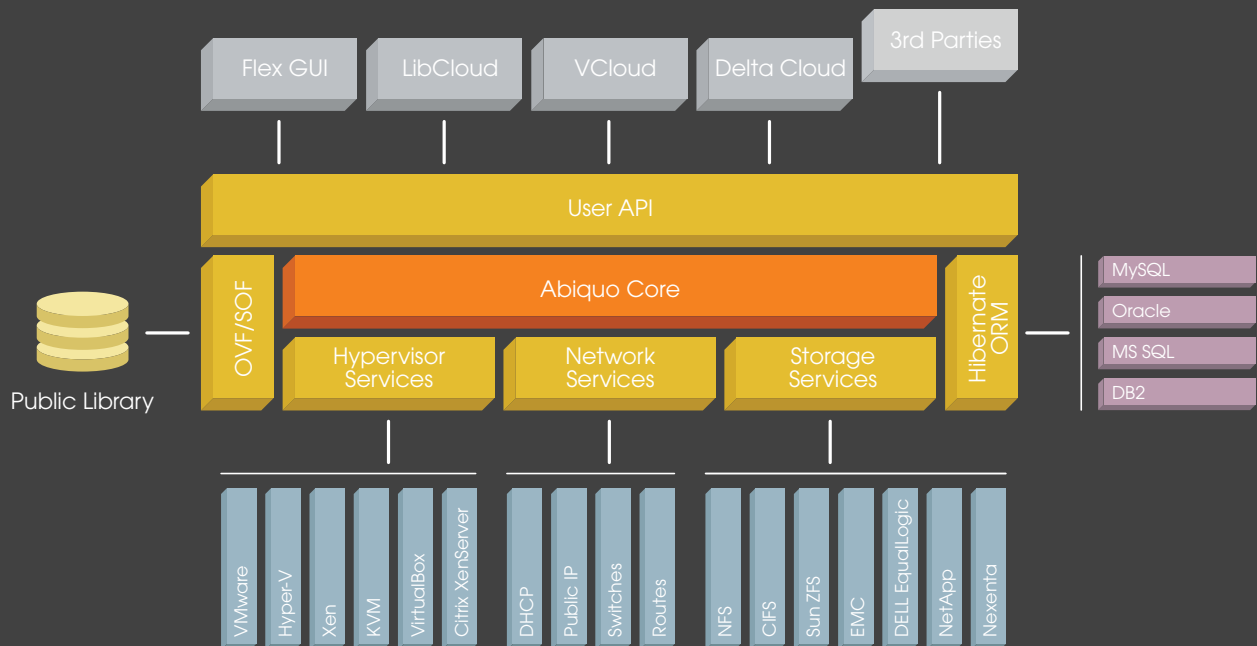
Enterprise Scalability

The Abiquo solution is designed to scale to meet the needs of the largest organizations. Stateless architecture provides three deployment models: single server for 100 VMs, multiple servers for 1000s of VMs, or multiple management clusters to manage over 100,000 VMs. Abiquo is built on industry standards to operate with other management tools, Web services, databases, storage systems, and networking.





Architecture

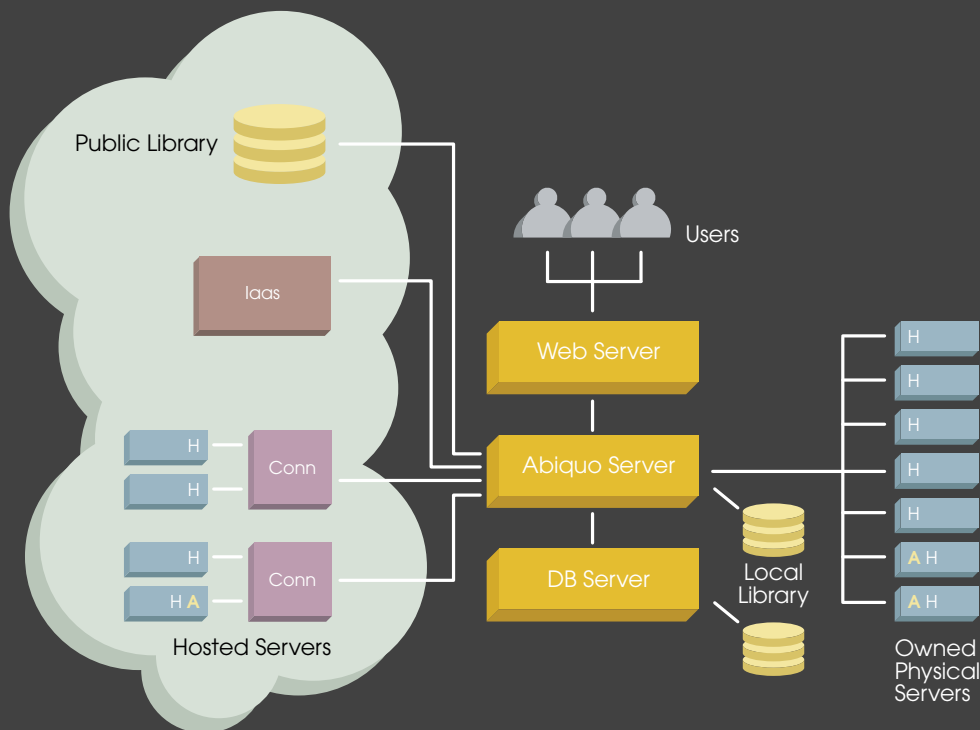


The Abiquo solution employs a standards-based modular architecture, designed to interface with a wide variety of hypervisors, networking components, storage systems and databases. Unlike products initially built around a particular hypervisor or device, this allows Abiquo to be readily extended to support additional platforms and devices, and to provide customers with complete flexibility.

Abiquo automatically stores all virtual machine images in Open Virtualization Format ("OVF"), storing virtual disks in a Stream Optimized Format ("SOF"). Among other benefits, this provides for rapid conversion between hypervisor types. While all common hypervisors are already supported, an abstraction layer allows new versions and further hypervisors to be supported with ease. Similar abstraction provides the same for Networking and Storage services. This allows tasks such as public and private IP address allocation and volume management to be provided through a common user interface.

Written entirely in Java, the Abiquo server components can run on virtually any operating system platform. The use of Hibernate Object/Relational Mapping ("ORM") allows the customer to select a database to match corporate standards. Built on Adobe Flex, the intuitive graphical user interface gives a role-based view of the installation, and allows even un-trained users to manage it with ease. The modular architecture allows a variety of third-party APIs to be supported, ensuring immediate compatibility with many third party products. Abiquo's own native API provides a rich interface to third party products, or for direct integration with customer's own systems.

Deployment



A typical Abiquo installation consists of central server components, together with remote service agents in each physical datacenter. All can be deployed on the customer's choice of bare metal operating system or virtual machine. Depending on scalability needs, the Abiquo components can be installed on a single machine or split across multiple machines. Abiquo can use a wide variety of industry standard databases, leveraging virtually any available performance or high availability option.

Abiquo connects directly, or via management APIs, to a wide variety of storage and networking components. Remote connectors provide for a secure control "pipe" to remote servers, or to servers provided by hosting companies to support a hybrid cloud deployment. Abiquo installs on live running installations, without requiring re-configuration or re-booting of any hypervisor machine. It can automatically take a complete inventory of each running hypervisor machine, including all relevant hardware characteristics as well as Virtual Machine inventory. Abiquo can therefore be deployed progressively, over whatever period the organization desires.

A variety of industry standard resilience options are available, but it should be noted that running Virtual Machines are not dependent on the Abiquo server for continued operation. The failure of any Abiquo component will not affect a running VM, and on restart of the Abiquo infrastructure, it will automatically perform a status inventory to determine the current running state of all hypervisor machines and VMs.

abiquo®

Enterprise Cloud Management

Global Headquarters

203 Redwood Shores Parkway, #280
Redwood City, CA 94065
United States
T: +1 650 264 5900
F: +1 650 264 5901
hq@abiquo.com

UK Sales and Support

43-45 Portman Square
London, W1H 6HN
United Kingdom
T: +44 (0) 20 3151 0900
F: +44 (0) 20 3151 0901
uk@abiquo.com

Research and Development

453bis Avinguda Diagonal, 4th Floor
08036 Barcelona
Spain
T: +34 933 22 00 05
F: +34 933 22 00 06
spain@abiquo.com