



What's New in VMware vSphere® 5.1- VMware vCenter Server™

VMware vSphere 5.1

TECHNICAL MARKETING DOCUMENTATION
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Introduction

Datacenters continue to evolve. This evolution involves increasingly larger and more complex datacenters. Due to technologies such as cloud computing and distributed applications, administrators must have scalable tools and services to manage these environments in the most efficient manner possible.

As a leader in datacenter virtualization and management, VMware® understands these needs and continuously strives to excel in this area. With the release of VMware vSphere® 5.1 (vSphere 5.1), VMware vCenter Server™ (vCenter Server) optimizes the foundations of cloud computing and enhances the virtualization platform. This provides the necessary management framework required to deliver the needs of today's virtualization administrators. It also gives other VMware applications and third parties a service to build on and integrate solutions with.

- The introduction of **VMware® vCenter™ (vCenter) Single Sign-On** offers administrators a deeper level of authentication services that enable VMware solutions to trust each other.
- The enhanced **VMware® vCenter™ Inventory Service (vCenter Inventory Service)** optimizes client server communications by reducing the number of client requests on vCenter Server. It also enables users to create and add inventory object-level tags. These are then used to organize and provide quicker retrieval with inventory searches.
- The updated **VMware vSphere® Web Client (vSphere Web Client)** provides a rich application experience delivered via a cross-platform supporting Web browser. This surpasses the functionality of the trusted VMware vSphere® Client™ (vSphere Client) running on Windows.

This paper presents these three architectural game-changing features and the exciting benefits that they bring to the modern datacenter.

Key Components

The release of vSphere 5.1 includes many new features and functionalities. Three of the most compelling components are discussed in detail in the following sections.

vCenter Single Sign-On Server

When administrators deploy multiple solutions within an environment, it is the lack of a true single sign-on that creates difficulties for them. They often must authenticate repeatedly with the same credentials when they switch between various virtualization solutions. With vSphere 5.1, vCenter Single Sign-On is a critical component of vCenter Server. It eases the authentication process with proven industry standards for the VMware environment and provides the following benefits:

- Additional identity sources through added support for authentication using Open LDAP and NIS repositories alongside Microsoft Active Directory
- Support for multiple identity sources, including multiple Active Directory forests/domains or mixed identity sources
- The ability of vCenter Server solutions to trust each other without requiring authentication every time a solution is accessed
- Architecture supporting multi-instance and multisite configurations that provide availability of vCenter Single Sign-On servers located locally or geographically dispersed for single-solution authentication across the entire environment

Administrators can utilize additional identity sources to maintain their current identity solution(s) of choice and provide user and solution authentication without a Microsoft Active Directory server. When users log in to the vSphere Web Client with a user name and password their credentials are sent to the vCenter Single Sign-On server. The credentials are then authenticated against the back-end identity source(s) and exchanged for a security token, which is returned to the client to access the solutions within the environment.

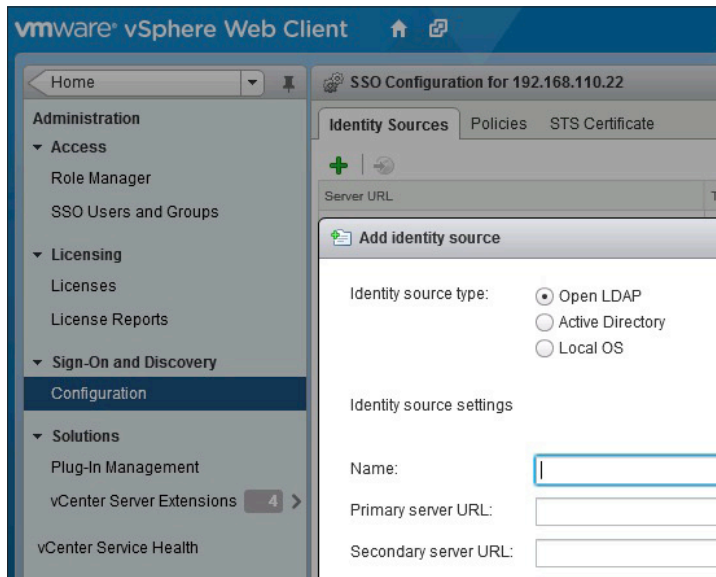


Figure 1. vCenter Single Sign-On Administration

Users no longer log in to a vCenter server directly, so a background discovery service maintains a list of all vCenter Server components and automatically populates the vSphere Web Client with the vSphere 5.x vCenter servers to which users have been granted access. With vSphere 5.1, users have a single pane-of-glass view of their entire vCenter Server environment because multiple vCenter servers and their inventories are now displayed. This does not require Linked Mode unless users share roles, permissions and licenses among vSphere 5.x vCenter servers.

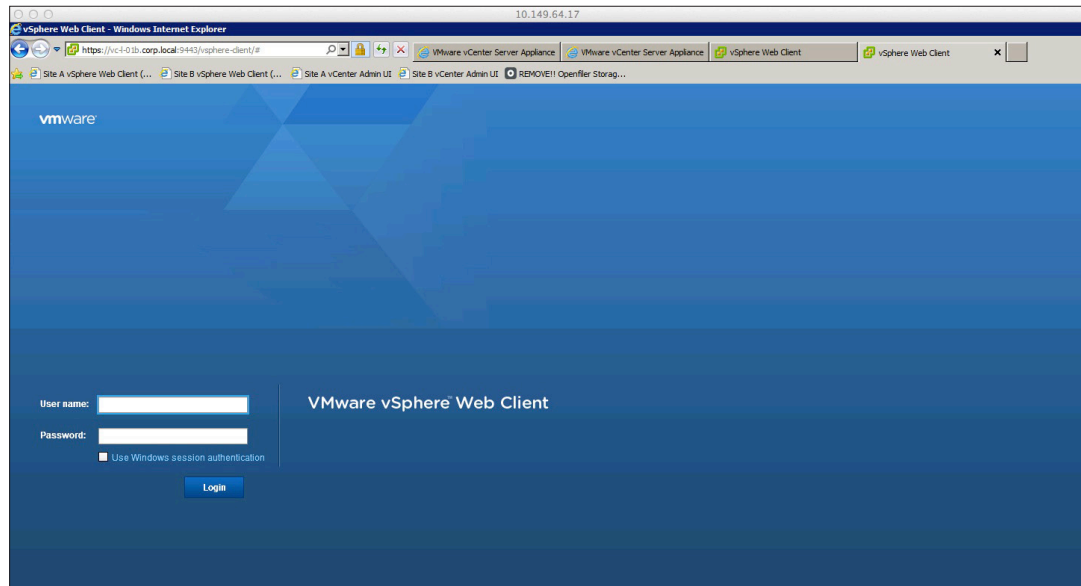


Figure 2. vSphere Web Client Login Screen

NOTE: The traditional vSphere Client does not support vCenter Single Sign-On and communicates directly with vCenter Server and Microsoft Active Directory.

vCenter Inventory Service

vCenter Server responsiveness is one of the challenges administrators face when environments grow. This can be the effect of multiple client connections to the vCenter server. Active vSphere Client connections, idle connections such as a session that a client has left open, poorly written scripts and so on impact performance of the vCenter server. With vSphere 5.1, vCenter Inventory Service reduces direct client requests to the vCenter server with query caching, reducing the load on core vCenter Server processes.

The main use case of the vCenter Inventory Service is to manage the vSphere Web Client inventory objects and property queries that the client requests when users navigate the vSphere environment. The vSphere Web Client requests only information viewed on the screen, so navigation is more efficient. In vCenter Server 5.0, vCenter Inventory Service was a separate process. With the updated vCenter Server, it is now a separate independent component and can be offloaded to a separate server or closer to the vSphere Web Client. This reduces traffic and improves response times.

vCenter Inventory Tagging

A new feature of vCenter Inventory Service enables users to create custom defined tags that can be categorized and added to any inventory objects in the environment. These tags are searchable metadata and reduce the time to find inventory object information.

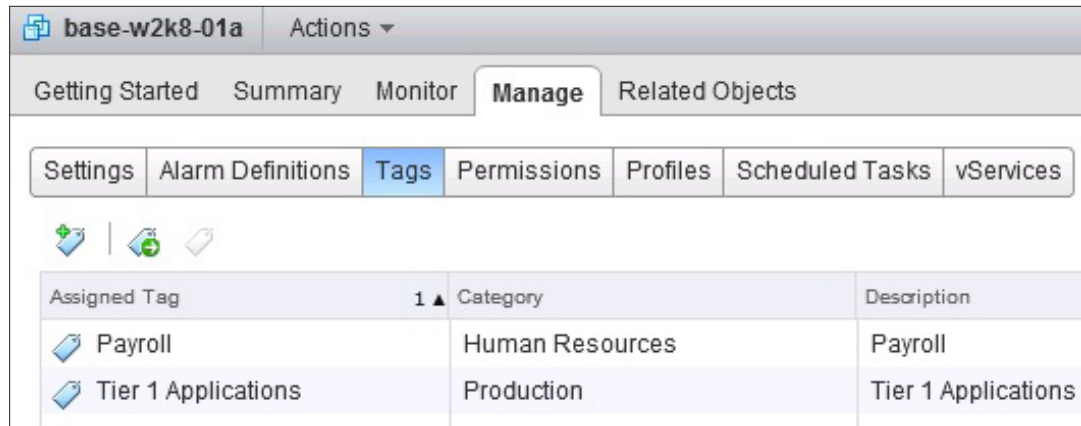


Figure 3. vCenter Inventory Service Tags

Multiple tags can be created or applied to the same inventory object to create granular metadata. This enables users to create different groupings of inventory objects. Tags might include configuration attributes, (such as all virtual machines with more than 4GB RAM) or business classification (such as all Tier 1 applications within the sales department). These groupings can be used to retrieve not just virtual machines but networking, datastore and cluster information as well.

This benefits the administrator by simplifying management and making information more easily available.

vSphere Web Client

How an administrator interacts with their environment has a great impact on their effectiveness managing it. The proliferation of virtualization and cloud-based technologies creates the necessity for a management tool that includes the following capabilities:

- The capacity to work within a heterogeneous environment
- A flexible and extensible foundation to enable customization
- Ready access to information
- An ability to manage a large number of objects across geographically dispersed datacenters

VMware developed the vSphere Web Client to meet these requirements and to provide a sustainable user interface model.

Innovation Comes Standard

Out of the box, the vSphere Web Client provides numerous features and functionalities enabling administrators to manage large-scale distributed environments. The following sections cover a few of the key features included in the vSphere Web Client.

Inventory Lists

Retrieving information in a hierarchical environment often requires movement through multiple levels to reach the wanted object and then repetition of the process. Although this method does enhance organization through objects' inheritance of parent properties, it becomes time consuming and its usefulness becomes limited as environments grow. When these large environments contain many types of objects, results can be lengthy. Also, they are not managed completely by a single solution, when in fact they all have overlapping functions that interact with the same objects.

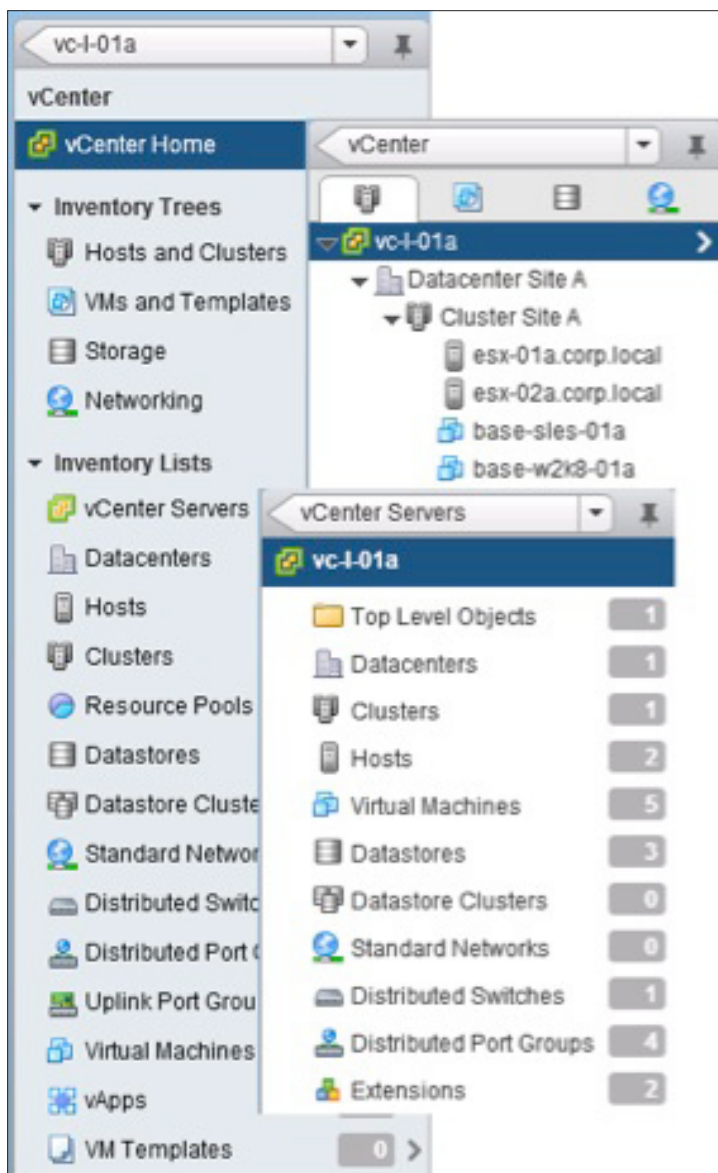


Figure 4. Inventory Lists with Preserved Hierarchy Tree

The vSphere Web Client introduces a new paradigm for navigation of objects. It uses relationships of all objects that interact with a selected object, and is designed to navigate with very few levels, which means fewer clicks.

Inventory lists are a dominant part of the vSphere Web Client. These are dynamic lists of objects that relate to the navigated object, organized by inventory type. For example, selection of a vCenter returns multiple lists of object types within that vCenter object. From here the selection of the cluster list returns a display of all clusters present, as well as lists of all object types that relate to the cluster or clusters selected, including lists of virtual machines, datastores and networks.

This process of viewing and traversing objects by their relationships repeats itself as the user manages the infrastructure, decreasing time required as relationships among objects are determined. Until now this was not possible and it was necessary for users to switch among multiple hierarchy trees and drill down multiple levels to reach each element.

With the updated vSphere Web Client, a history is maintained as navigation proceeds through multiple lists of object types. Now users have the ability to reverse navigate if necessary. Because this introduces a new way of administration, the hierarchy trees are maintained in the same vSphere Web Client window for backward compatibility.

Because inventory lists return information about object relationships, users see a complete picture of the environment. This speeds up navigation and provides a richer and more powerful management platform.

Graphical User Interface Customization

The saying “Every problem is a nail when all you have is a hammer” provides an excellent metaphor for common user-interface design. Most user interfaces are static in design and attempt to display all the information that every user might want. The problem here is that not everyone uses a graphical user interface for the same purposes. In a VMware-enabled environment, there might be administrators who are primarily tasked with managing the infrastructure services, such as storage or networks. In contrast, there might be other administrators who are primarily concerned with the management of virtual machines. Both types of administrators often are bombarded by information that they do not need to perform their daily tasks.

The vSphere Web Client addresses this problem by enabling the user to customize their visualization of the user interface in a way that best suits them. It is possible with the vSphere Web Client to move information presented by the user interface to a different location or to eliminate it all together. Furthermore, the vSphere Web Client also utilizes a progressive inclusion model for displaying information. This means that applicable information will be displayed only as requested by the user instead of forcing them to see all the information up front.

In this way, the vSphere Web Client provides the flexibility for administrators to use a single tool in a manner that is most efficient.

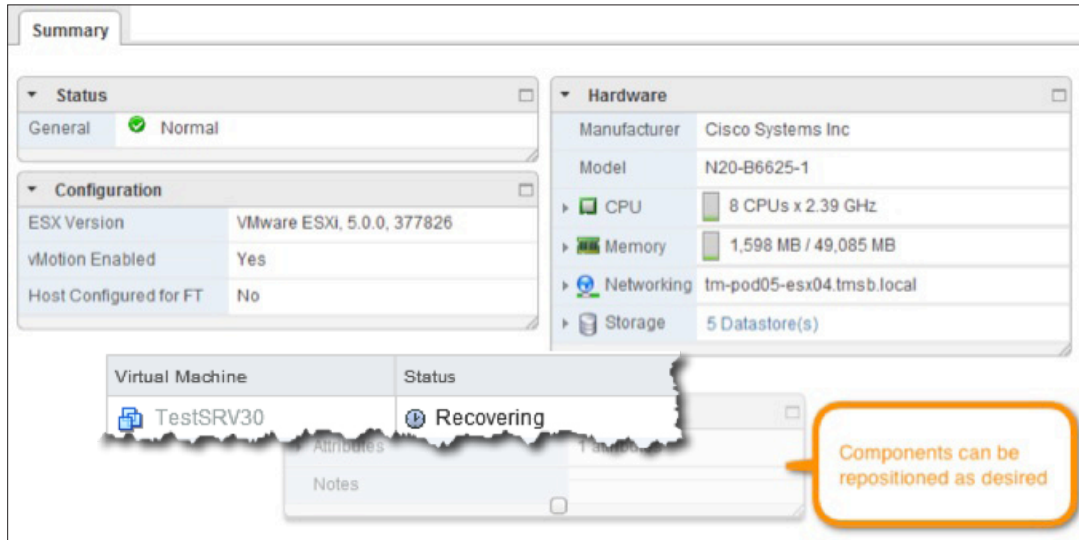


Figure 5. Repositioning UI Components

Common Action

Administrators tend to perform repetitive tasks under normal circumstances. Decreasing the time it takes to perform such tasks helps to reduce frustration and increases productivity. The vSphere Web Client provides a context-sensitive area where the most common tasks are performed quickly and easily.

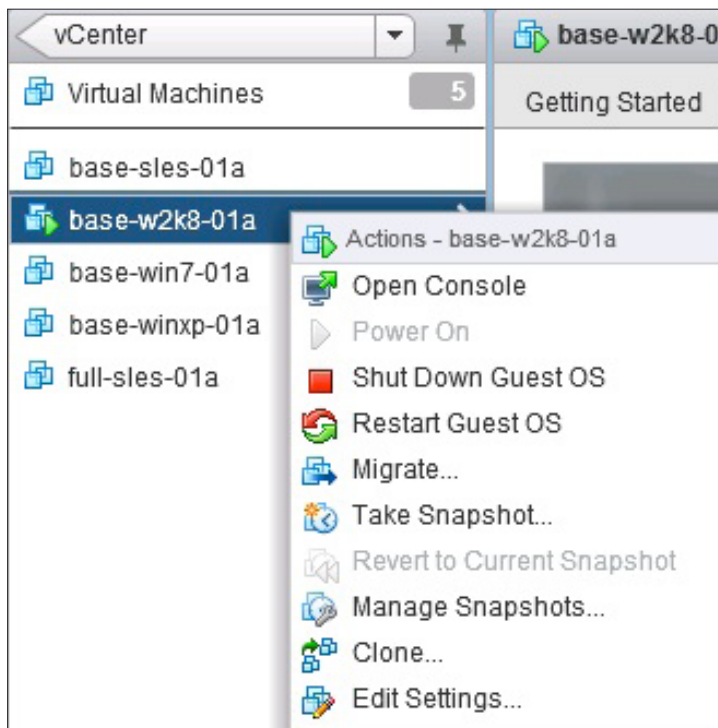


Figure 6. Quick Access to Common Actions

Work-in-Progress Workflows

It is not always possible to perform a task in a linear fashion. Often people get interrupted by more pressing tasks. Alternately, they might need to get some information required to complete the task. Standard user interfaces require a user to quit the task that they are performing and then restart the task from the beginning when they return to it. This is not the case with the vSphere Web Client.

The vSphere Web Client adds support for interrupt-driven workloads. This agile management feature enables administrators to start a task and pause it if they get interrupted. They can then return to the exact point at which they paused the task.

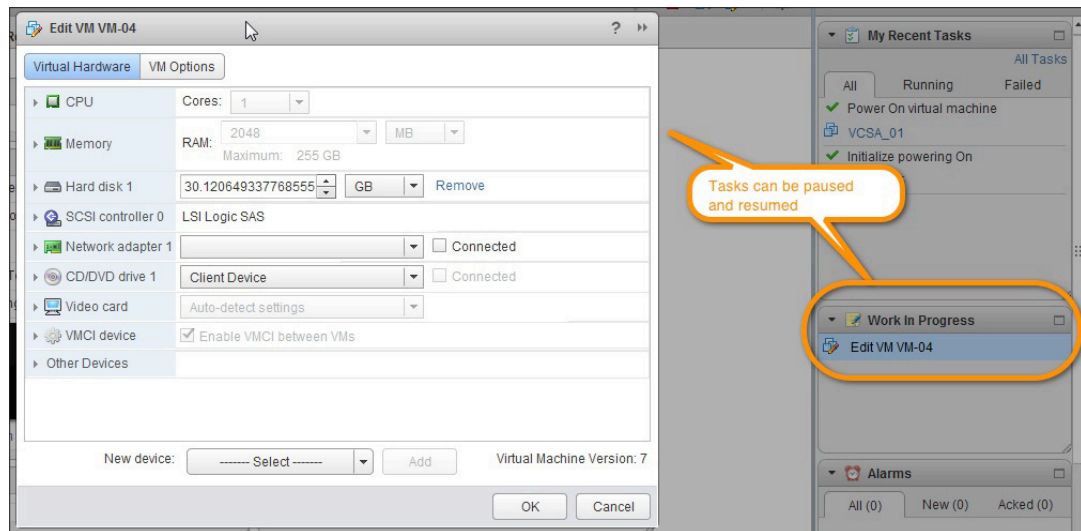


Figure 7. Interrupt-Driven Workflows

Advanced Search

To perform a task, one first must be able to find the objects upon which they need to work. In a small environment, this might not seem very difficult. However, when the environment scales out to cloud levels it becomes a larger challenge to find objects.

As with previous VMware clients, the vSphere Web Client provides a search capability. This enables users to perform a variety of searches, from simple text-based searches to more advanced searches utilizing Boolean logic. The vSphere Web Client also enables administrators to save a search as a named object. They can then create a complex search and refer back to it quickly instead of recreating the search.

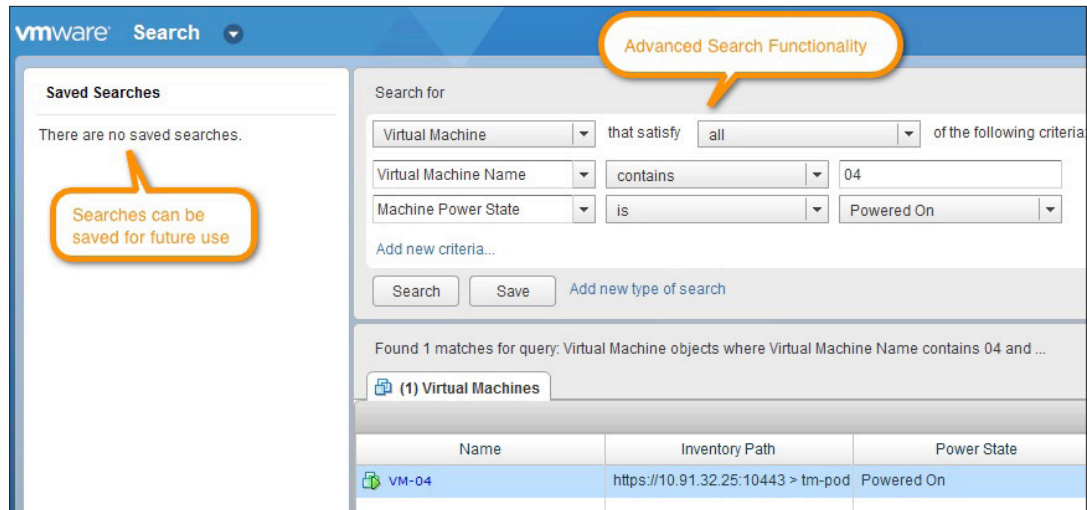


Figure 8. Advanced Search Functionality

Extensibility

Many third-party vendors provide useful tools and functionality that complement the capabilities of the vSphere Web Client. This benefits administrators because it enables them to perform many actions under a single pane of glass.

The functionality of the vSphere Web Client is now easier to extend. A user can add to or modify almost everything that they can interact with in the user interface. A rich set of documentation provides developers with the information necessary to create new extensions and functionality quickly.

Under the Hood

The features and functionality of the vSphere Web Client wouldn't be possible without a robust engine capable of providing the scale and flexibility required. The components of this revolutionary engine are discussed in the following section.

Architecture

The vSphere Web Client uses a standard three-tiered model of operation. These tiers include the following:

- **vSphere Web Client**

The vSphere Web Client runs as an Adobe Flex-based application within a supported Web browser. Current browsers supported include Internet Explorer in Windows-based operating systems and Mozilla Firefox and Google Chrome in both Windows- and Linux-based operating systems.

This flexibility enables any user with a Web-enabled system, regardless of platform, to manage the environment. It also decreases the burden on administrators to manage the deployment of the client software to individual systems.

- **Application Server**

The application server is based on Virgo and tc Server from VMware's SpringSource division. This is a completely module-based Java application server designed to run enterprise Java applications and Spring-powered applications flexibly and reliably. In the vSphere Web Client, the application server provides an OSGi container and various services that enable third-party vendors to scale and extend applications.

- **vCenter and Associated Services**

vCenter and associated services provides a central point of reference as the third tier. The core vCenter Server process feeds live data to the vCenter Inventory Service and then transmits that to the application server as required.

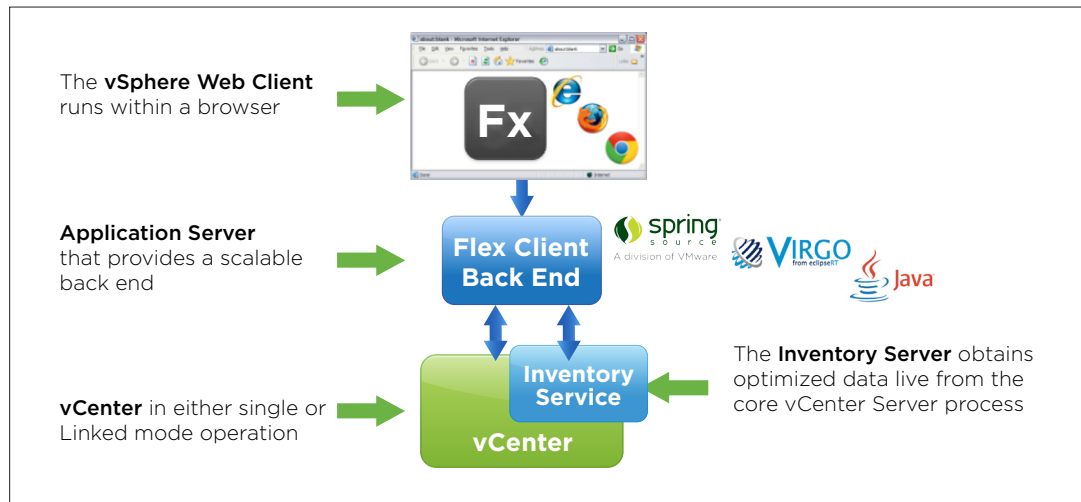


Figure 9. vSphere Web Client Architecture

Deployment and Management

Deployment of the vSphere Web Client involves the installation of the vSphere Web Client server binaries on a supported 64-bit system when the Windows-based vCenter Server is utilized. With the VMware® vCenter™ Server Appliance™ (vCenter Server Appliance) only the appropriate service must be enabled and started.

After deployment of the vSphere Web Client, administrators register each vCenter server instance to be managed with the vSphere Web Client through a Web-based vSphere Web Client administration application page. No further management is required.

To upgrade the vSphere Web Client, administrators simply remove the vSphere Web Client server binaries and install the new packages.

IT departments must be concerned only about updating a single system when using the vSphere Web Client. It is not necessary for them to give new software to every user of the client. This significantly decreases the management costs typically associated with such software deployments.

Summary

With the improvements added to VMware vSphere 5.1, the VMware vCenter Server architecture, VMware vCenter Single Sign-On, VMware vCenter Inventory Service and the VMware vSphere Web Client, VMware has released a formidable collection of tools for the administrator of a virtualized environment.



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