

# Parallels® Virtuozzo Containers

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White Paper

## Workflow Management

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## Automation is Key to Service Delivery for Business Units

Today's smart IT managers focus on how to automate the datacenter to increase the quality of services delivered within the organization as a key element in their business alignment strategies. Virtualization is shown to effectively reduce operational costs such as power consumption and physical asset costs, but still has untapped potential in providing administrators automated mechanisms to provision and manage the datacenter's virtual infrastructure. Effective automation tools, such as workflow management, allow administrators to recoup time from the reduction or elimination of repetitive low-value tasks. IT departments can graduate from running as a reactive organization to one that functions in a proactive manner and is focused on service delivery and alignment with the business units of the company.

With the acceptance of virtualization as a key technology strategy that can radically change the procurement and operational plans of datacenters, IT managers need to find the best mix of virtualization techniques and tools so that they don't just replace physical server sprawl with virtual machine or operating system sprawl. IT managers need proven solutions for achieving a flexible infrastructure that can service their business unit customers and is designed to ease the workload on the IT administrative staff. Parallels Virtuozzo Containers' new workflow management capabilities that come bundled into the full-featured management console are now offered as a step towards a more automated datacenter.

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## Flexible Security Model is the Foundation of the Workflow Management Module

Successful workflow management modules are predicated on strong and flexible security models that allow for the identification of users and creation of attributes that govern user behavior. Virtuozzo's workflow management module is built on the idea that there is no one right way to administer your containers or virtual infrastructure, so tools have been bundled into the Virtuozzo product to ensure that you can design a virtual infrastructure that provides the right fit for your organization.

Virtuozzo's security model is designed to deliver the utmost in secure containers while employing a flexible architecture that allows you to customize access to hardware nodes and individual Containers as needed to allow the right people to administer their own environments without the need for IT support. Offering several tiers of administrative rights, including root access where appropriate to users outside of the traditional IT organization, allows IT managers to reduce requests such as restarting a Container and application installs by allowing authorized users the ability to self-service their own Container.

Implementing your security model is quite easy in Virtuozzo. As the Virtuozzo datacenter administrator, you can use the credentials of the root (Linux) or Administrator (Windows) user to manage the hardware nodes and all containers that exist therein via a centralized administrative module which comes with both a client and a browser-based user interface. In designing your security model that governs the operation and interaction with your organization's Containers, several options are available for your use.

### USERS AND GROUPS

Users are those individuals that are identifiable by name and that will interact with Virtuozzo to perform a defined set of tasks. Users may then be organized into groups based on geographic, topical, or task-based similarities. Virtuozzo makes it easy for you to add and modify users and group relationships by retrieving information from users stored in your local computer, external Microsoft Active Directory databases, LDAP-compliant databases, and/or by entering users directly into Virtuozzo's authentication database. In the typical configuration whereby Virtuozzo retrieves user information from Active Directories, Virtuozzo server will only store information on role assignments and maintain all other information in the external database to ensure that duplicate data does not exist.

The screenshot shows the Virtuozzo web interface. At the top, there is a search bar and the user is logged in as Administrator. The left sidebar contains navigation options: Setup, Network, Backups, Licensing, Security, and VE Samples. The main content area is titled 'Register Authentication Database' and is divided into four sections:

- General Settings:** Database Name \*
- Connection Settings:** Server Address \*, Port \* (389)
- Login Settings:** Login \*, Password, Domain
- Directory Settings:** Base DN \*

*Register your LDAP-compliant databases to allow users access to Virtuozzo*

## ROLES, PERMISSIONS, AND SCOPES

If using Virtuozzo' authentication database - roles and permissions can be assigned to allow users and groups to perform specific operations in different scopes. Virtuozzo comes with pre-populated roles such as Administrator, hardware node administrator, and workflow user that represent common roles in typical Virtuozzo installations, but you also have the ability to define as many roles as needed. Once permissions are defined, you may narrow the application of these to one of four different scopes: containers, hardware nodes, groups and logical units.

Preparing your users for utilizing the Workflow Management module is easy. There are three levels of user interaction within the Workflow Management module. You may authorize administrators to request the creation of new Containers, process requests to create new Containers, and troubleshoot Containers. Select which level is appropriate and simply add the correct role, or add the role to the group level and all members can then submit requests. Your designated administrators will now be able to log into their appropriate Virtuozzo management console and work the request queue, and participating users will be able to request new Containers and receive automated emails upon submission that denote approval/rejection.

The ability to define as many users, groups, roles and permissions as your organization needs and modify these at will through your normal methods that will then appear in the centralized management module makes administration of Virtuozzo simple and ensures consistency of security settings across your network.

## Custom Samples Ensure Accuracy and Decrease Time to Provision

Once your security model is implemented, you can utilize several of Virtuozzo's additional built-in time-saving tools to make management of your virtual infrastructure as efficient as possible and give business unit-level users the ability to self-provision through a structured process that ensures consistent accuracy of container configurations and performance.

One such feature that promotes operational accuracy and consistency of containers is Virtuozzo's ability to create samples. Samples are a pre-configured set of applications and parameters of a container that an authorized user may select during the container set-up process. As the virtual datacenter administrator, you often receive requests from web developers for the creation of a new web development site. The set up of all of the software, database, and tools that the web developer needs is timely and needlessly blocks work progress for all involved. You decide to set up a new sample that will contain all of the applications, parameters and database that is typically needed and call the sample "Web Dev Site". You set up this sample so that when the designated web developer requests a new Container, the set-up is already pre-configured and awaiting your approval to start the automated set-up of a new container. The Container sample ensures that the time spent on Container provisioning is focused on special set-up needs instead of routine set-ups which can be standardized and then automated to provide your organization both accuracy and efficiency.

The screenshot shows a web interface titled "Setup VE Samples". It includes a search bar, a table of 19 samples, and various action buttons like "New Sample", "Clone", "Set as default", and "Delete". The table has columns for Name, Platform, Architecture, Description, OS Template, and Save. The samples listed include "Copy-of-Oracle", "CreatedFromVEVE899", "FinancialAnalystIITeam", "MSDE", "NewAPEmployee", "NewSample", and "Oracle".

Name ▲	Platform	Architecture	Description	OS Template	Save
Copy-of-Oracle	Windows	i386		w2k3	Save
CreatedFromVEVE899	Windows	i386		windows_2003_std_sp2-5.2.3790 / 20070503	Save
FinancialAnalystIITeam	Windows	i386	Sample used by the Financial Analyst II level teams for their data analysis	windows_2003_std_sp2-5.2.3790	Save
MSDE	Windows	i386		w2k3	Save
NewAPEmployee	Windows	i386	Basic setup for new AP employee on Windows. Includes MS Office and Oracle	windows_2003_std_sp2-5.2.3790	Save
NewSample	Windows	i386		windows_2003_std_sp2-5.2.3790	Save
Oracle	Windows	i386		w2k3	Save

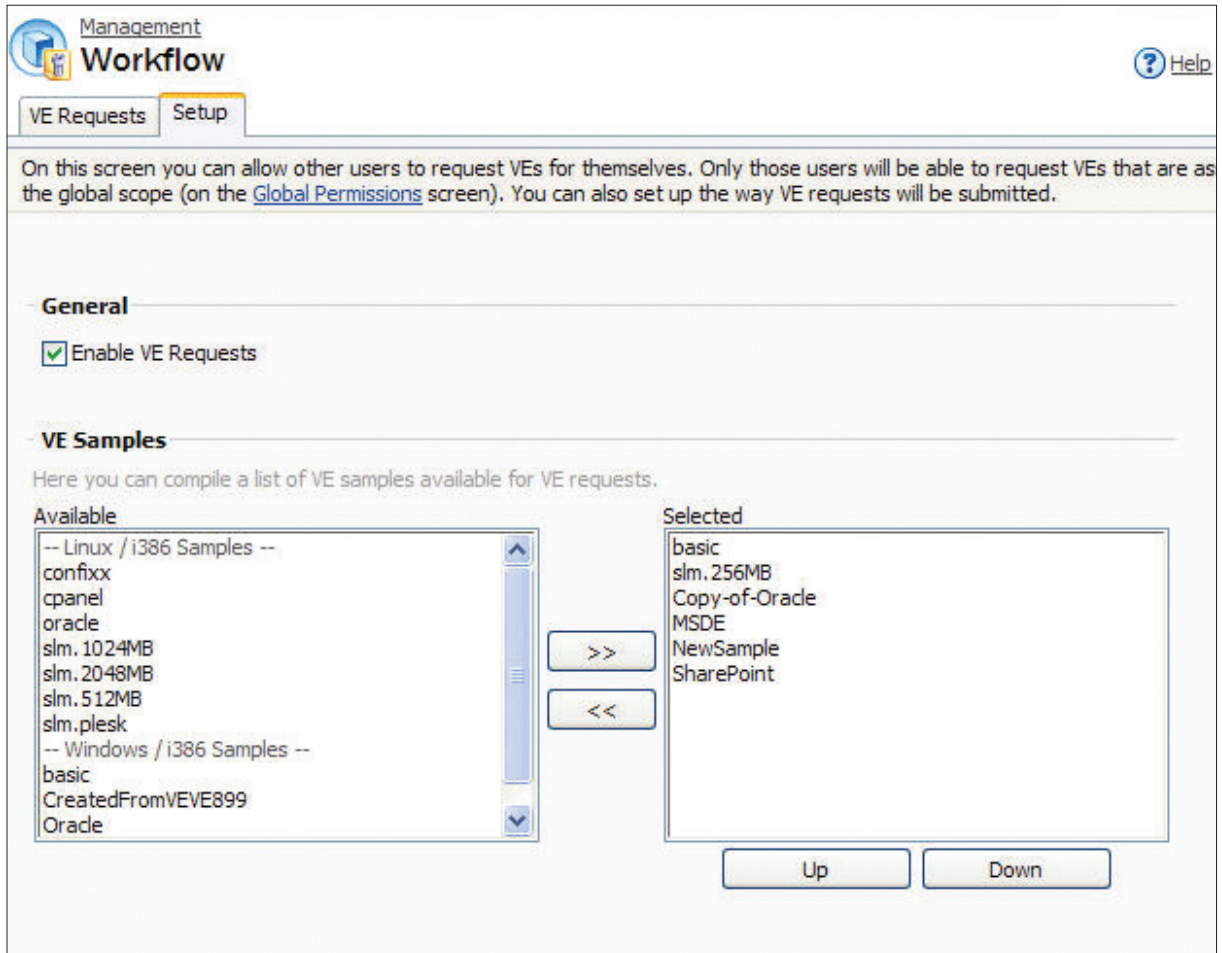
*Master list of Container Samples for effective management by the Administrator*

Samples leverage Virtuozzo' template capability to allow the hardware node administrator to template an application so that it exists within Virtuozzo one time, yet can be used by any container by placing a pointer in the container that links back to the installed application. Templating is one of the reasons that virtualization overhead hovers around 3% and delivers near-native performance. You can create as many application templates as needed and place them into any or all of the Containers that you designate, as well as apply patches or upgrades to the OS or application template that will then be instantly delivered to all Containers saving you from having to install, upgrade, or patch the application or operating system on a one-by-one container basis.

## Using Workflow Management

### ENABLING WORKFLOW MANAGEMENT IN PARALLELS VIRTUOZZO CONTAINERS

With your security configured and your samples ready, you are now ready to use the Workflow Management capability of Virtuozzo to extend administrative privileges to your application and database administrative users that work outside of the IT department in functional business units. To enable the workflow option, simply check “Enable Container Requests” and select which samples you want available to your business unit-level users when they make requests for the provisioning of a new server.



*Virtual Datacenter Administrator Enables the Workflow Management Module*

Following enabling Container requests and saving the setting, the set-up of your Workflow Management module is complete and administrative and business unit-level users can begin to make requests.

## REQUESTING CREATION OF A NEW CONTAINER

When assigned business unit-level or designated administrative users need a new Container, they simply log into the Virtuozzo Control Console web interface using their normal login credentials and click on the “New Container Request”. Requestors then just need to fill in the information on set-up of the new Container, assign the Container’s administrative password, select from the pre-configured sample list, add a description and submit to the virtual datacenter administrator for approval. The flexible security model allows you to grant the ability to request a new Container at the individual or group levels.

Management > Workflow  
New VE Request  
Screen ID: 22.00.00.01.00  
Help Active Tasks Upper Level

**VE Owner**  
Please select the user who will be the owner of the requested VE. \*  
jackieminga

**VE Configuration**  
VE Sample \* MSDE

**VE Administrative Password**  
Enter password \*  
Retype the password \*

**Advanced VE Configuration**  
Name  
Hostname

**Description**  
Need a new database setup for Project Kildea. Need by 9/28/07

\* Required fields  
Request Cancel

*New Container Request Form*

## MINIMAL ADMINISTRATIVE EFFORT TO CREATE A CONTAINER

Once requests are submitted, the virtual datacenter administrator receives email notification of the request to prompt him to log into the Virtuozzo management console to review the workflow task list. To approve, simply click the “New Container” button and step through the Container setup wizard to set configurations and manually designate the hardware node on which the new Container will reside, or “quick create” to install the Container with all of the applications and configurations already outlined within the selected sample and installed on a hardware node that Virtuozzo automatically designates based on resource availability. The new Container is delivered and ready for use approximately 10 seconds following approval.

Management Workflow

Screen ID: 22.00.00.00.00

Help Active Tasks Refresh Upper Level

VE Requests Setup

Posted after Status Owner VE Sample

Search Reset Results Customize

VE Requests (2) Per page: 10 | 20 | 40 | 80 Select Columns Hide Search

New VE Request Reject Request(s)

Posted	Owner	Status	VE	VE Sample
Sep 18, 2007 10:33:47 AM	qauser	Open	n/a	slm.256MB
Aug 28, 2007 12:36:24 PM	qauser	Open	n/a	SharePoint

*Virtual Datacenter Administrator's Workflow Container Request Queue*

Management > Workflow

Screen ID: 22.00.00.03.00

Help Active Tasks Refresh Upper Level

Review VE Request

**Request Details**

Posted: Aug 28, 2007 12:36:24 PM

Status: Open

**Owner Details**

Owner Name: qauser

Submitted From IP Address: 208.251.212.1

**VE Configuration**

Name: 34

Hostname:

Sample: SharePoint

New VE Reopen Request Reject Request

*Virtual Datacenter Administrator Approves and Creates New Container or Rejects Request*

## Workflow Management as Key Element of the Agile Organization

Utilizing a workflow-enabled virtual infrastructure provides a multitude of benefits to administrative users, virtual datacenter administrators, and the organization as a whole. Workflow management is a key element of the agile organization because it bridges the gap between IT and business units to promote partnership and facilitate change management. Several positive effects are seen when workflow management is implemented in enterprise organizations.

## **SHARING OWNERSHIP OF CONTAINERS DECREASES BLAME EFFECT**

Granting business unit-level users access to workflow processes empower users to take action when needed and alleviate feelings of frustration that arise when the business unit-level user is forced to rely on IT to perform a simple task that cannot be completed in a timely fashion due to queuing or inability to focus on non-crisis management tasks. Workflow management allows the business unit-level user to participate in the creation of a container and therefore, take ownership in the process. The two-way participation in Container creation helps to form a bond between the business unit and IT which reduces finger pointing and the ability to place blame due to perceived deficiencies or inadequacies.

## **STREAMLINED CONTAINER CREATION ENSURES ACCURACY**

The virtual datacenter administrator benefits from automating the routine task of Container set-up so that the required time and effort to complete the task is around 2 minutes with guaranteed accuracy based on pre-set configurations and standard set-up processes. No longer will the virtual datacenter administrator need to cut and paste requests from email and create each Container on a one-off basis. Once the Container samples and templates are set-up, each new Container is quickly and accurately provisioned with no interference from the administrator.

## **DECREASED RESPONSE TIME TO NON-CRISIS MANAGEMENT ISSUES**

The workflow management module of Virtuozzo can significantly decrease the response time of IT to business unit-level users and prevent stopped work projects due to delays based on IT's inability to perform routine tasks due to resources. Workflow management ensures that routine tasks can easily be performed and are no longer put through a triage process that often lands them at the bottom of the list based on their perceived lack of importance and criticality.

## **ENFORCEMENT OF COMPLIANCE AND REGULATORY POLICIES**

Using a documented workflow process to manage provisioning of operating system and application licenses supports adherence to your organization's IT policies and procedures. With one interface that captures all information about the user groups, applications, and attributes of the environments in which users work, your IT organization can easily track usage and licensing agreements to ensure compliance. Additionally, Virtuozzo includes a detailed task log that includes visibility into the kernel-level performance of your one OS so that you have a full audit trail and can easily troubleshoot Container performance issues.

## **CONTROL COSTS**

Virtuozzo's built-in workflow management tools clearly cut costs in terms of IT administrative labor, but also promote server consolidation and the use of containers as a whole. Workflow management allows business unit-level users to become better educated about virtualization and remain aware of the ability to use containers to provide solutions to work challenges.

Virtuozzo promotes growth while controlling costs in two ways. First, Virtuozzo allows hundreds of containers to exist on one server which can greatly reduce hardware costs and extend the length of refresh cycles. The quick and easy creation of Containers gives businesses the ability to dynamically grow and use Containers to solve work problems. Your organization can promote controlled growth with its check-and-balance system that requires administrative approval to ensure the size of the container infrastructure remains in control. Moreover, since there is only one operating system, there is little fear of OS sprawl that could cause OS licensing needs and maintenance to spiral out of control.

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## Summary

An organization's ability to quickly respond to change is referred to as organizational agility. Enterprise businesses become more agile when bottlenecks are removed and business units are empowered to participate in procuring the tools needed to complete their work. The benefits of workflow management processes combined with server virtualization are touted as promoting agility based on the ability to achieve high Container density per server and providing a mechanism that allows business unit-level users and IT managers to effectively work together to provision new containers. With Virtuozzo server virtualization software and built-in workflow management tools, enterprise IT organizations can easily support business unit level requests for the creation of new Containers by allowing business unit-level users to initiate the provisioning process and then automating the Container creation process based on organizational policies and processes. Resulting benefits are seen in terms of increased efficiency to provision Containers and in accuracy of the created Container. Virtuozzo's workflow management tool eliminates work stoppages that previously existed due to IT's lack of resources to handle routine work orders for provisioning new containers, and enables business units to play a part in IT's service delivery model.