What's New Document

Parallels® Virtuozzo Containers

www.parallels.com

Version 4.0

Introduction

Parallels Virtuozzo Containers is the industry's leading OS virtualization solution that creates isolated containers to support business-critical applications on a single physical server and OS instance. Virtuozzo offers unparalleled levels of ease-of-use, manageability, performance, efficiency and density while delivering native performance and dynamic resource management.

Version 4.0 focuses on:

Ease-of-Use and Manageability
Version 4.0 continues to make it faster and easier to benefit from using Virtuozzo.

- Easier installation and configuration
- Improved resource management and control
- Device sharing and forwarding

Business Continuity
Version 4.0 includes several new options to optimize uptime and protect the virtual IT infrastructure.

- Windows Server Clustering Support
- Red Hat Clustering Support
- Extensive backup enhancements

Efficiency
Version 4.0's architectural enhancements provide higher levels of performance and stability while driving greater levels of efficiency through optimized system resource usage.

- Real time optimization of hard drive resources
- Architectural enhancements improving stability and efficiency
- Improved Virtuozzo File System

Version 4.0 also introduces Parallels Infrastructure Manager (PIM), a powerful web-based, centralized management interface tool, as an optional add-on to Virtuozzo. IT administrators can efficiently manage their virtual infrastructures from anywhere at anytime.

- **Scalability for Large-scale Design, Deployment and Management** - PIM can empower hundreds of administrators to manage up to thousands of physical servers and tens of thousands of containers. PIM provides effective management through physical and logical views of the data center and empowers users with role-based security and audit as well as multi-level delegation.
- **Complete Management of the Virtualized IT Lifecycle** - PIM enables IT administrators to effectively manage their virtual infrastructures holistically. Users can convert, provision, monitor, backup, deploy, recover, analyze, troubleshoot, repair, self-manage and migrate (P2V, V2V, V2P) containers within the virtualized IT infrastructure.
- **Easy to Use** - PIM facilitates effective management through intuitive wizards, tutorials and powerful dashboards for the data center.
- **Open: Easy to Integrate and Extend** – PIM is a virtual infrastructure management solution that provides support for industry standards such as SOAP, XML RPC, CLI, SNMP APIs and SDK as well as directory services such as LDAP and AD.
- **End-to-end Management** – PIM will provide upcoming multi-vendor virtualization management, including Parallels Server, Microsoft Hyper-V, VMware VI3, Citrix Xen and more. Multi-layer virtual management includes physical, VMs, containers and applications.

1. Management Tools

1.1 TOP FEATURES

1. **New Design** – Virtuozzo' two main management GUIs have been completely redesigned to improve their look, feel and ease-of-use and to provide complete management flexibility and enhanced usability. These redesigned interfaces offer a streamlined installation and access to centralized resources, including templates and sample containers.

    - **Parallels Infrastructure Manager (PIM)** - Previously known as the Virtuozzo Control Center (VZCC), PIM now includes multi-server and offline services management, management of logging periods and open terminal access to hardware nodes. A rich new set of usability enhancements include dynamic container status/parameters update and dynamic update of resource usage by Container/Node. The Screen finder is now integrated with global search.

    - **Parallels Management Console (PMC)** - Previously known as the Virtuozzo Management Center (VZMC), PMC is the integrated management interface that now includes a simplified managed object navigation tree, multi-tabbed view for templates and User/Groups and Logs as well as the use of a lightweight SSH client for communications between PMC and Parallels Virtuozzo 3.x nodes. Administrators can also monitor and configure Service Container from the PMC console.

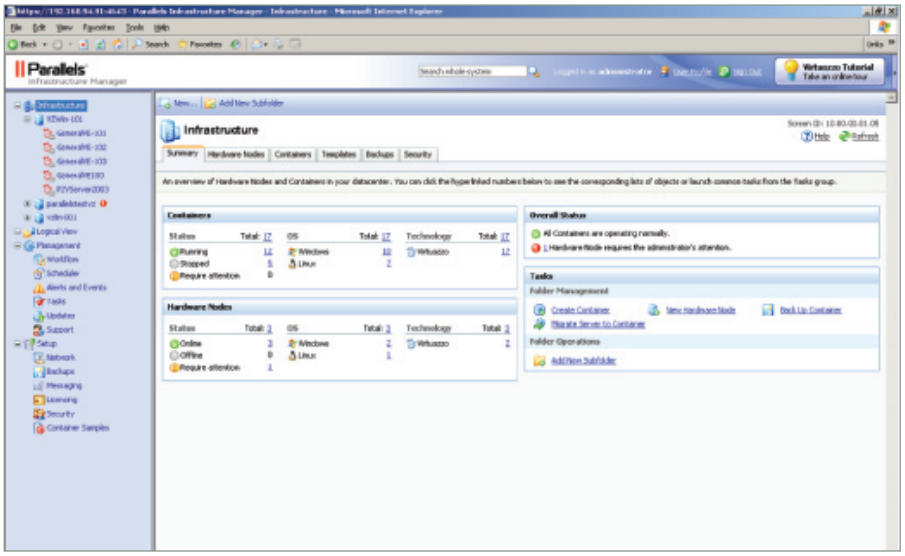

Figure 1 PIM enables web-based anytime, anywhere management.

2. **Centralized Multi-Server Management** – Version 4.0 introduces cross-server management and accessibility of templates, container samples and backups for easier management of Virtuozzo servers, containers and resources in large deployments.

3. **Complete Management Flexibility** – The two main interfaces have been completely redesigned to provide complete management flexibility.

    - **Organization** – Install servers and containers according to regular hardware infrastructure or create specialized logical organization with departments or other designations. Organizations can be nested and titled with simple, easy-to-reference labels.

- **Universal Management** – As servers and containers are grouped logically or physically, tasks can be deployed universally across the groupings. Examples include installing an application to a group or deploying an update.

- **Customization** – There are more than 20 choices for login customization. Users can select which screen to log into, administrators can log into the container provisioning screen and support personnel can log into the monitoring screen.

4. **Backup Enhancements** – Container backup enhancements that are now available on all platforms include scheduling, selective file browsing, restoring, labeling, faster incremental backups and backing up while keeping a container online. Cross-platform backup is now possible. Store a Windows container backup on a Linux server and a Linux container backup on a Windows server.

5. **Parallels Transporter** – Formerly Windows 2000 VZP2V, this physical-to-virtual tool is now expanded to upgrade Windows 2000 servers to Windows 2003 servers and then convert them into Virtuozzo containers.

6. **Template Enhancements** – Create a centralized template repository, distribute templates from one location and access them from Virtuozzo servers. Additional enhancements include:

   - EZ Templates download
   - EZ Template copy between servers
   - EZ Template removal
   - EZ Template cache with update, pre-fetch and status information
   - EZ Template proxy server
   - Container owner install
   - Review version
   - Update and status

7. **Improved Support for Multiple Ethernet Network Interfaces** – Version 4.0 includes the ability to manage multiple NICs from both the browser-based and GUI tools. These NICs may be used to create redundancy with multiple connections to a single container and may be configured to different networks and VLANs to direct or control network traffic and access.

8. **Simplified Virtuozzo License** – All of Version 4.0's components and management tools are enabled with a single license key string. It is also no longer necessary to submit the hardware node ID for licensing.

9. **Roles and Permissions Management** – An entire Virtuozzo permissions module has been added. Virtuozzo-specific roles can be created. LDAP users can be imported into the permissions module, and the Virtuozzo permissions can be applied to the LDAP users. Permissions may be assigned at all levels of the management tool organization.

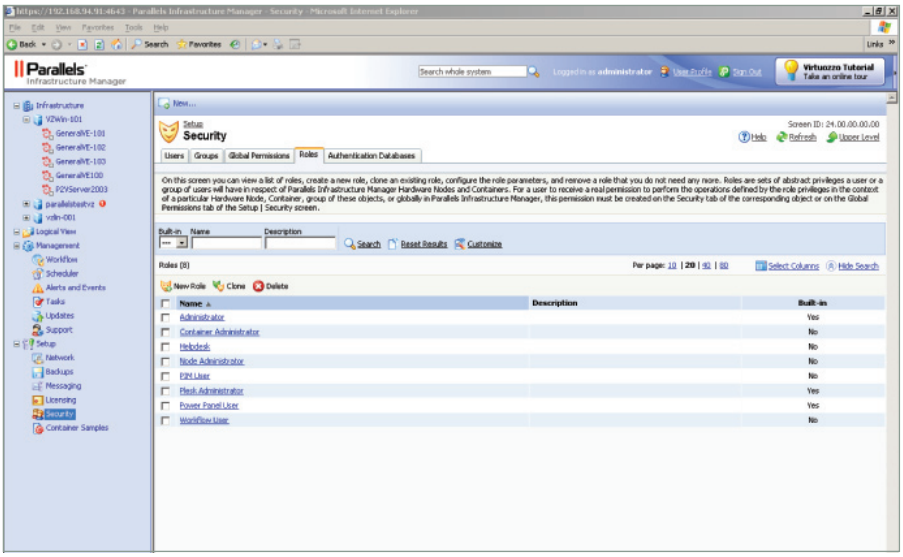

Figure 2 - Assign any user's roles and permissions with an easy-to-use interface.

1.2 FOR SERVICE PROVIDERS

As part of the OPEN FUSION initiative, many of Version 4.0's features enable tighter integration between Virtuozzo and other systems and products.

1. **Plesk Integration** – Improved integration between Plesk Control Panel and Parallels Power Panel (PPP).

2. **Plesk Key Save** – Plesk license keys are automatically restored on a container reinstall.

1.3. ADDITIONAL NEW FEATURES

1. **SLM** – Service level management is now fully available in all management tools. SLM is a simplified resource management setting for simple container deployment. The ability to fine-tune the many parameters remains for when detailed resource changes are required.

2. **Virtuozzo System Search** – Search to find any container-related keyword in name, description or other container fields.

3. **Fast Management Enhancements** – Version 4.0 enables multiple container cloning and multiple container creation.

4. **Faster Connectivity** – New secure connection using its own transport encrypted by SSL enables faster operations.

5. **Re-Installation Improvements** – The Windows reinstall is improved and retains the GUID.

6. **Nomenclature Change** – The general term for a Virtuozzo partition has been changed from a virtual private server (VPS) to a container.

7. **Smart-Install** – Virtuozzo may now be downloaded as an executable file and launched locally.

See the release notes for a full listing of new features.

2. Parallels Virtuozzo Containers for Windows

2.1 TOP FEATURES

1. **High Availability and Configuration Support** – Parallels Virtuozzo Containers 4.0 for Windows supports:

    - **Network Load Balancing** – Balance the workload between multiple active containers either on the same or on different servers using Microsoft Load Balancing.

    - **Full-Server Cluster** – Use this configuration to provide redundancy for all of the containers on a server. This configuration is enabled by loading Microsoft clustering on the host and treating each container as a clustered service. Microsoft Clustering enables a failover from an active server to a passive server. This configuration assumes data is stored on a redundant SAN.

    - **Container/Application Level Clustering** – Cluster containers or applications so that if a container or application is unavailable, it is failed over on a passive server. All configurations include a combination of active and passive instances, and data is stored on a redundant SAN. Some configuration examples include:

        - Standalone servers running cluster-aware applications can be paired with passive containers. Typically, several passive containers will be loaded on the same server because these containers are not running and many can reside on the same server.

        - Cluster-aware applications can be loaded in containers along with clustering software. The software will behave as if it is on a standalone server. Any application-supported configuration will be possible, including multiple nodes of active application containers and passive containers.

2. **Hardware Device Forwarding and Sharing** – Designate a particular hardware device to a specific container or share a hardware device amongst several containers.

3. **Expanded Third-Party Backup and Recovery Support** – Version 4.0 comes complete with an extensive range of capabilities in its backup toolset. For organizations that wish to back up containers by using the same procedures as other standalone servers, Version 4.0 supports the following third-party backup agents at the host level:

    - CA ARCserve Backup r11.5
    - EMC Legato Networker 7.3.2
    - IBM Tivoli Storage Manager 5.3.0.0
    - Microsoft Windows NTBackup
    - Symantec (Veritas) Backup Exec 11D

    Data replication product support for disaster recovery includes CA WANsync v4.0.69 and 4.0.72.

4. **Accurate Windows Container File Footprint** – A container's size (hard drive space) is dependent on the data files in the container. This enhancement allows the file size to reflect the current contents of the container rather than the hard drive resource assignment. This new capability allows the container footprint to accurately reflect the size by immediately increasing or decreasing the container file size in near real time as data files change. The new

footprint capability enables Virtuozzo to have the highest level of resource efficiency without reconfiguring or reclaiming space.

5. **Parallels Transporter** – Formerly known as Windows 2000 VZP2V, this physical-to-virtual tool is now expanded to upgrade Windows 2000 servers to Windows 2003 servers. This upgrade and migration tool makes a copy of the Windows 2000 environment and migrates it into 2003 without altering or upgrading the original environment, making it a nearly risk-free migration. The upgrade tool is perfect for testing application performance on Windows 2003.

6. **VSS Aware Online Snapshot** – Virtuozzo backup uses Microsoft's Volume Shadow Copy Service's (VSS) capabilities to perform a reliable backup of applications such as Active Directory, Oracle and Microsoft SQL. This snapshot can be taken of any VSS compatible application without downtime or interruption in the application.

7. **Bandwidth Management** – Control, assign and monitor bandwidth usage between containers.

8. **Virtual CPU Improvements** – CPUs accessed by containers may now be restricted. For example, a container may see only two CPUs on a server, enabling the limitation of application licensing to the corresponding number of CPUs. The guarantee of the CPU has also been enhanced. Administrators have a simple way to guarantee resources to a container.

9. **Container Level Kernel Event Reporting** – Container-specific kernel drivers can trigger events. These events are now reported to the container level event log rather than the main Virtuozzo administrative log.

10. **Expanded Network Adapter Support** – Network adapters can now be managed more fully with multiple NICs, mode management (bridged/routed) promiscuous mode support, DLC protocol support, RAS server support and the ability to change virtual MAC addresses.

2.2 ADDITIONAL NEW FEATURES

1. **VLAN Support** – Version 4.0 supports container network adapters bridging with VLAN adapters. Virtuozzo administrators can create virtual networking infrastructures meeting strict security requirements with complete network traffic isolation. (Available previously in SP1.)

2. **Virtual SCSI** – Virtual SCSI drives can be created within a container.

3. **Distributed Link Tracker Support** – Containers can contain links that can be moved to other network locations. This capability enables recognition of moved links and new locations.

4. **Smart-Install** – Version 4.0 may be downloaded as an executable and launched locally.

5. **VPN Server** – VPN Servers may now be loaded and run in a container.

6. **Microsoft Host Integration Server 2000** – Version 4.0 supports the Microsoft Host Integration Server 2000, Service Pack 1 DLC protocol.

7. **SNMP** – Version 4.0 has an industry standard management information base (MIB), which

allows it to be managed by SNMP-driven management tools.

8. **More Anti-Virus Support**

   - AVG 7.1.394 and 7.5.x
   - CA eTrust R8 and R8.1
   - Dr.Web 4.44
   - F-Secure 5.52-82
   - Kaspersky 6.0.2.678
   - McAfee 8.5
   - Symantec 10.1.4.4000 and higher
   - TrendMicro OfficeScan 8

9. **DHCP Support** – Run both server and client DHCP in a container.

10. **Installation Enhancements** – Upgraded installation enables an unattended setup. The Korean version of Windows 2003 is now supported.

11. **Container Update Tool** – The software status and patch level is now viewable in the container registry. The update tool will enable version validation with the host software and replace software with links whenever possible.

12. **Container Memory Size** – Memory resources are displayed based on a particular container.

13. **Support Enhancements** – Version 4.0 has a standard VPN user, enabling a secure session for support to connect and resolve issues. The submit support issue capability has also been upgraded to eliminate the need for an RDP connection.

14. **Faster Backup and File Exclusion for Windows** – Faster backups and file exclusion are now enabled.

15. **Parallel Container Start** – Containers boot more quickly with parallel processing.

16. **Optional SiteBuilder Integration** – Version 4.0 includes the option to integrate the Parallels SiteBuilder software with Virtuozzo.

17. **Local Patch Server** – Set up a local patch server for containers to receive patches and run vzup2date on an internal network without access to the Internet.

See the release notes for a full listing of features.

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3. Parallels Virtuozzo Containers for Linux

3.1 TOP FEATURES

1. **Red Hat Cluster Suite Support** – Use Red Hat Cluster Suite to cluster Parallels Virtuozzo containers in the same manner that standalone servers are clustered. Containers are clustered in an active passive configuration, and Red Hat Clustering performs the failover. This configuration assumes data is on a redundant SAN.

2. **Burstable CPU Limit** – A container can burst up to 100% of the available CPU on the server for a predetermined amount of time. After the allotted time, the container will get only its upper limit of CPU.

3. **Pure Red Hat Advanced Server Kernel 2.6.18** – This Red Hat release provides a higher

level of stability and security and increases hardware and software compatibility.

4. **Backup Enhancements** – Version 4.0's backup includes online backup, single file restore, backup scheduling and improved network backup time.

5. **Installation Improvements** – Installation has been streamlined and made more user-friendly.

6. **Online vzcache Upgrade** – vzcache is an important tool for maximizing server efficiency. With Version 4.0, this capability is faster and backup/migration is more reliable, keeping applications and servers available while making more efficient use of memory and space with vzcache consolidation.

7. **VZFS Upgrade** – The enhanced Virtuozzo file system has increased efficiencies in disk space usage and in daily operations, including migration and backup.

8. **FUSE Support** – Filesystem in a user space support will allow many different filespaces to run in the user space. Filesystems include NFS, samba mounts, encrypted filesystems, etc.

9. **I/O Management** – Monitor the amount of disk I/O a container uses and prioritize the I/O amongst containers. This functionality can assist in specialized container management and accounting for usage chargeback.

3.2 ADDITIONAL NEW FEATURES

1. **VLAN Support** – Version 4.0 supports container network adapters bridging with VLAN adapters. Parallels Virtuozzo administrators can create virtual networking infrastructures meeting strict security requirements with complete network traffic isolation. (Available previously in SP1.)

2. **Container Suspend and Restore** – Freeze a container and place it in a suspended state. The container can be restored by the container owner.

3. **SNMP** – Version 4.0 has an industry standard management information base (MIB), which allows it to be managed by SNMP-driven management tools.

4. **Container Kickstart** – Containers may now be created using a kickstart-like scenario, including properties such as packages, install scripts, etc. Create application configurations such as full install, minimal, etc.

5. **Container NFS/GFS Client** – Mount and use Parallels Virtuozzo on NFS or GFS storage.

6. **Local Patch Server** - Set up a local patch server for containers to receive patches and run vzup2date on an internal network without access to the Internet.

7. **Template to EZ Template Upgrade** – Upgrade old templates to the new EZ Template format.

8. **Faster Live Migration** – The Live Migration capability (moving a container to another server and maintaining its availability) is now faster with a new iterative memory movement process.

9. **DHCP Server** – Run DHCP server and client in a container and assign an IP address to a container.

10. **EZ Templates Centralized Server** – Create a central server that caches EZ Templates to save traffic, enable a central point of update and maintain a repository of packages that may be deleted locally.

11. **Mount Partition Script** – Version 4.0 allows a remote login to the server even with file system errors.

12. **vzpkglink for EZ Templates** – Manually installed RPM files may now be replaced with links.

Summary

Parallels Virtuozzo Containers is designed for homogeneous environments optimized with single OS virtual environments. It is optimized for various types of workloads within an organization's IT infrastructure, including computing environments to support high-end database or application servers as well as servers on the same operating system (OS).

Parallels Server, which complements Virtuozzo, is designed for virtualization of heterogeneous environments with multiple OSes and applications. Designed to handle specific workloads, each solution is a key component of Parallels' end-to-end server virtualization platform that effectively addresses major IT infrastructure issues afflicting today's organizations.

Parallels Infrastructure Manager, an optional add-on to Parallels Virtuozzo that empowers IT administrators to effectively control and manage their IT infrastructures as they need to. Designed specifically to provide greater control, flexibility and ease-of-use, PIM gives IT administrators access to physical servers, containers and their OSes and applications through a central, customizable, web-based management interface.