

PARALLELS SERVER BARE METAL 5.0 README

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This document provides the first-priority information on the Parallels Server Bare Metal 5.0 release and supplements the included documentation.

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1. ABOUT PARALLELS SERVER BARE METAL 5.0

Parallels Server Bare Metal 5.0 is a virtualization solution that allows you to simultaneously run Parallels virtual machines and containers on the same physical server, thereby making more efficient use of your server's hardware resources.

2. WHAT'S NEW IN PARALLELS SERVER BARE METAL 5.0

Parallels Server Bare Metal 5.0 includes the following new features and improvements:

- **Cloud Linux 6.1 with kernel 2.6.32.** Parallels Server Bare Metal 5.0 is based on Cloud Linux 6.1 with kernel 2.6.32. This kernel provides a number of improvements, including better performance, optimized process handling, better memory addressability, enhanced resource control and stability.
- **Support for servers with 64 CPU cores and 128 GB of RAM.** Parallels Server Bare Metal 5.0 can be installed on servers with up to 64 CPU cores and 128 GB of RAM.
- **Disk I/O limits.** You can configure the bandwidth that a container or virtual machine is allowed to use for disk input and output (I/O) operations with the `pctl set <CT_ID|VM_name> --iolimit` command. Limiting disk I/O bandwidth can help you prevent situations where high disk I/O activities in one container or virtual machine will slow down the performance of other containers and virtual machines on the same server.
- **Disk I/O accounting.** You can view disk I/O statistics for containers and virtual machines by using the `pstat` utility or by examining the `/proc/bc/<ID>/iostat` file. These statistics will enable you to easily identify the containers and virtual machines that generate the highest disk I/O load on the server.
- **Support for the iotop utility in containers.** You can now run the `iotop` utility in containers to determine the processes that generate the highest disk I/O load.

- **Parallels Virtual Automation 4.6.3 support.** Parallels Virtual Automation (PVA) 4.6.3 can now manage servers running Parallels Server Bare Metal 5.0. If you want PVA support, you can install the PVA components (PVA Agent and PVA Master Node) at the same time that you're installing Parallels Server Bare Metal.

Note: To set up the PVA Master Node component, an active Internet connection is required.

- **Zero-downtime migration for virtual machines.** The *pmigrate* utility now supports migrating virtual machines with zero downtime, eliminating any service outages or interruptions for end users.
- **Online migration improvements for containers.** You can now migrate containers that have one or more Network File System version 3 (NFSv3) directories mounted; containers that have one or more AutoFS mount points (including NFSv3 directories managed by AutoFS); and containers with processes that have open device files, named pipes, and Unix sockets hidden by another file system mounted over the directory where these objects reside.
- **IPv6 support.** This release provides full support for using IPv6 addresses with virtual machines and containers, including support for traffic shaping and accounting.
- **Customizable DHCP pools for host-only networks.** You can now configure the range of IP addresses that the Parallels DHCP server allocates to virtual machines in host-only networks. You can either define a custom IP address range in a kickstart file when performing an unattended installation of Parallels Server Bare Metal 5.0, or change the default IP address range after the installation using the Parallels Management Console or the *prlsrvctl* utility.
- **E1000 virtual adapter support.** Now E1000 virtual network adapters are used to handle network traffic in virtual machines. The E1000 virtual network adapters provide high-performance networking for virtual machines, including jumbo frames support. The E1000 adapters are enabled by default in newly created virtual machines that run the following operating systems:
 - Windows Vista or later
 - Linux with kernel 2.6 or later
 - all other supported non-Linux and Windows operating systems
- **USB device assignments.** You can assign a USB device to a virtual machine, causing the device to be automatically connected to the virtual machine when you plug the device into the Parallels server or when you start the virtual machine.
- **Viewing statistics for virtual machines.** You can now monitor resource statistics (such as CPU usage, disk usage, and network traffic) for virtual machines using the *pnetstat* and *pstat* utilities.
- **CPU limit in megahertz.** Along with setting a CPU limit for virtual machines and containers in relative units, you can now set this limit in MHz. In such a case, the CPU limit will remain the same regardless of the total CPU power of the server on which the virtual machine or container resides.
- **SATA support.** Parallels Server Bare Metal 5.0 now supports using SATA devices (virtual disks and CD/DVD-ROM drives) in virtual machines. SATA devices can be added to and removed from both running and stopped virtual machines.
- **CPU and memory hotplug support.** You can now turn on CPU and memory hotplug functionality in virtual machines, which enables you to dynamically configure both the number of CPUs and the amount of memory in your virtual machines.
- **Compatibility with Parallels products.** You can use virtual machines created in the following Parallels products with Parallels Server Bare Metal 5.0:
 - Parallels Desktop 6 for Mac
 - Parallels Server for Mac 4.0

- Parallels Server for Mac 4.0 Bare Metal Edition
- Parallels Desktop 4 for Windows and Linux
- Parallels Workstation 4.0 Extreme
- **Support for converting third-party virtual machines.** You can now convert Microsoft Hyper-V, Microsoft Virtual PC, Virtual Box, VMware, and Xen virtual machines to Parallels virtual machines. Depending on the type of virtual machine, the conversion can be performed by means of the *pctl*, *pri_convert*, or *prigrate* utility.
- **Traffic shaping and accounting.** Network traffic can be now shaped and accounted for in both containers and virtual machines.
- **CPU affinity.** On physical servers with multiple processors, you can now bind virtual machines and containers to specific CPUs, so that only those CPUs are used to handle the processes running in these virtual machines and containers. This approach can increase your system performance by up to 20%.
- **Private networks.** You can now create private networks on physical servers to include virtual machines and containers to different subnets. The virtual machines and containers from one subnet are not allowed to access virtual machines and containers from other subnets, outside the private network, and computers on external networks.

At the same time, you can create weak private networks where virtual machines and containers cannot communicate with virtual machines and containers on other subnets but can connect to virtual machines and containers outside the private network and to computers on external networks.

- **Host-routed networking mode for virtual machines.** Network adapters of virtual machines can now operate in the host-routed mode. In this mode, all network traffic is routed via special virtual network adapters on the physical server.
- **New memory management scheme for containers.** Parallels Server Bare Metal 5.0 introduces a new scheme for managing memory-related parameters in containers—*VSwap*. Like many other memory management schemes used on standalone Linux computers, this scheme is based on two main parameters: RAM and swap.
- **Improved memory management for virtual machines.** You can now configure the reserved memory limit and the memory quota for virtual machines. The first parameter defines the amount of memory on a Parallels server that can be used by all virtual machines hosted on this server. The second parameter is composite and allows you to control the memory consumption by particular virtual machines.

3. SYSTEM REQUIREMENTS

The hardware and software requirements for Parallels Server Bare Metal 5.0 are as follows:

- **Platform:** X86 or x86-64 platform with Intel VT-x or AMD-V hardware virtualization support.
- **CPU:** 1.5 GHz or higher processor (a 64-bit processor is required for launching 64-bit guest operating systems).
- **Memory:** 2 GB or more RAM (4 GB recommended).
- **Hard disk:**
 - *root (/):* allocate 10-12 GB of disk space to the / partition.
 - */vz:* format this partition as ext3 and allocate all the remaining free space to it (no less than 30 GB).
 - *swap:* paging partition for Parallels Server Bare Metal. Follow the guidelines in the table below:

RAM	swap
up to 4 GB	2 GB
4-16 GB	4 GB
16-64 GB	8 GB
64-256 GB	16 GB
256-512 GB	32 GB

- **Network:** Ethernet network adapter; valid IP address.
- **Other hardware:** DVD-ROM drive. (The Parallels Server Bare Metal 5.0 release is distributed as a DVD image, so your server must have a DVD-ROM drive to start the installation.)
- **Operating system:** None. Parallels Server Bare Metal 5.0 is installed directly on the server hardware and does not need any operating system for its functioning.

Both the actual number of virtual machines and containers you can run on a physical server and their performance depend on the resources they require. In general, the more resources your physical server has, the more virtual machines and containers you can run and the higher their performance.

4. SUPPORTED GUEST OPERATING SYSTEMS

Listed below are the operating systems that you can run in your Parallels virtual machines and containers:

Operating System	Virtual Machine	Container
Windows		
Windows 7 with Service Pack 1 (x86, x64)	Yes	No
Windows Server 2008 R2 with Service Pack 1 (x64)	Yes	No
Windows Server 2003 R2 with Service Pack 2 (x86, x64)	Yes	No
Windows Vista with Service Pack 2 (x86, x64)	Yes	No
Windows XP Professional with Service Pack 2 (x64) and with Service Pack 3 (x86)	Yes	No
Windows 2000 with Service Pack 4 (x86)	Yes	No
Linux		
Red Hat Enterprise Linux 6.1 (x86, x64)	Yes	Yes
Red Hat Enterprise Linux 5.6 (x86, x64)	Yes	Yes
Red Hat Enterprise Linux 4.8 (x86, x64)	Yes	No
Fedora 15 (x86, x64)	Yes	Yes
Fedora 14 (x86, x64)	No	Yes
CentOS 6 (x86, x64)	Yes	Yes
CentOS 5.6 (x86, x64)	Yes	Yes
CentOS 4.8 (x86, x64)	Yes	No

SUSE Linux Enterprise Server 11 with Service Pack 1 (x86, x64)	Yes	Yes
SUSE Linux Enterprise Server 10 (x86, x64)	No	Yes
openSUSE 11.4 (x86, x64)	Yes	Yes
openSUSE 11.3 (x86, x64)	No	Yes
Debian GNU/Linux 6.0 (x86, x64)	Yes	Yes
Debian GNU/Linux 5.0 (x86, x64)	Yes	Yes
Ubuntu Linux 11.04 (x86, x64)	Yes	Yes
Ubuntu Linux 10.10 (x86, x64)	Yes	Yes
Ubuntu Linux 10.04 (x86, x64)	Yes	Yes
Ubuntu Linux 8.04 (x86, x64)	No	Yes
BSD		
FreeBSD 8.1 (x86, x64)	Yes	No
FreeBSD 7.3 (x86, x64)	Yes	No
Oracle		
Oracle Enterprise Linux 5.5 (x86, x64)	Yes	No
Oracle Enterprise Linux 5.6 (x86, x64)	No	Yes

5. INSTALLING PARALLELS SERVER BARE METAL 5.0

To install Parallels Server Bare Metal 5.0, follow these steps:

- 1 Configure it to boot from the CD/DVD-ROM drive.
- 2 Insert the DVD with the Parallels Server Bare Metal 5.0 distribution set into the server's CD/DVD-ROM drive and restart the server.
- 3 When the server boots, press Enter to continue with the installation.
- 4 Click **Next** to accept the Parallels end-user license agreement. In the displayed window, click **Agree** to confirm your decision.
- 5 Specify a hostname for your server in the **Hostname** field; click the **Configure Network** button and set up your network settings. Click **Next**.
- 6 Set your time zone settings and click **Next**.
- 7 Enter the Parallels Server Bare Metal 5.0 license number and click **Next**.
- 8 Enter the password for the root account and click **Next**.
- 9 In the Partitioning window, select the **Use All Space** radio button, and click **Next**.

10 Specify a unique IP address and a unique hostname for the PVA Management Node and click **Next**.

Note: To set up the PVA Management Node, your server must have an active Internet connection. If it does not have one, clear this option. You will be able to set up the PVA Management Node later.

11 Click **Reboot** to restart the server.

Complete installation instructions on how to set up Parallels Server Bare Metal 5.0 on a dedicated server are provided in the *Getting Started With Parallels Server Bare Metal 5.0* guide, available on the Parallels Web site.

6. STARTING TO WORK WITH PARALLELS SERVER BARE METAL 5.0

After you successfully install the product and restart the physical server, you will be provided with instructions on how to start working with the Parallels Server Bare Metal 5.0 release.

In general, you have two ways of working with Parallels Server Bare Metal 5.0:

- Using the Parallels command-line utilities
- Using the Parallels Management Console

6.1. PARALLELS COMMAND-LINE UTILITIES

Parallels Server Bare Metal 5.0 provides a set of command-line utilities for managing Parallels virtual machines and containers both locally and remotely.

6.1.1. Connecting to Parallels Server Bare Metal 5.0 Locally

To manage virtual machines and containers locally— that is, from the same server on which Parallels Server Bare Metal 5.0 is installed—type **root** as the user name and enter the password you provided when installing the product.

After you have successfully logged onto the server, you can start creating and managing Parallels virtual machines and containers, using the following command-line utilities:

- *ectl*: use this utility to perform day-to-day operations on containers and virtual machines.
- *pmigrate*: use this utility to perform different types of migrations on servers running Parallels Server Bare Metal 5.0.
- *pstat*: use this utility to collect statistics on your virtual machines and containers.

For more information on these utilities, see their man pages.

6.1.2. Connecting to Parallels Server Bare Metal 5.0 Remotely

To connect to Parallels Server Bare Metal 5.0 remotely, use the IP address indicated on your server's screen. For example, you can use a Secure Shell (SSH) client to connect to the physical server. When logging onto the server, use the **root** user name and enter the password you provided when installing the product.

6.2. PARALLELS MANAGEMENT CONSOLE

If you prefer working with GUI tools, you can set up Parallels Management Console to remotely connect to Parallels Server Bare Metal 5.0. However, this tool is intended for managing Parallels virtual machines only. If you need to create a container or perform any operation on it, you should use the corresponding Parallels command-line utilities.

To set up the Parallels Management Console:

- 1 Make sure the computer on which you are going to install the Parallels Management Console meets the necessary system requirements. The requirements are listed on the Web page for the Parallels Server Bare Metal 5.0 release.
- 2 Download the Parallels Management Console installation file:
 - a. Open your favorite browser and type the IP address of the server running Parallels Server Bare Metal 5.0.
 - b. In the **Welcome** window, click the link corresponding to the system architecture on which you want to install the Parallels Management Console and download the installation file.
- 3 Install the Parallels Management Console.
- 4 Launch the Parallels Management Console and use it to connect remotely to the server running Parallels Server Bare Metal 5.0.

For more information on these operations, refer to the *Getting Started With Parallels Server Bare Metal 5.0* guide.

7. KNOWN ISSUES AND RESTRICTIONS

The known issues for Parallels Server Bare Metal 5.0 are as follows:

- The version of the Parallels Management Console shipped with the Parallels Server Bare Metal 5.0 release can be installed only on Linux and Windows computers. Installation on Mac computers is not supported.
- You may simultaneously run no more than 255 virtual machines and containers on a server running Parallels Server Bare Metal 5.0.
- If you plan to use IPv6 addresses with your physical server, make sure that you also assign at least one IPv4 address to the server. This is required for the correct operation of some Parallels utilities (for example, for *vzreport* and *vzup2date*).
- Virtual machines running Debian and Ubuntu distributions may fail to get their IPv6 settings via DHCP.
- Using DHCPv6 servers for distributing IPv6 settings to virtual machines that operate in the host-only networking mode is not supported.
- Snapshots may get lost after migrating virtual machines that were created in other Parallels products.
- The guest integration tools are not deleted automatically after converting or migrating third-party virtual machines to Parallels virtual machines. To work around the problem, remove the tools manually once the conversion is complete.
- When performing the Express installation for a virtual machine, Parallels Management Console may sometimes fail to install Parallels Tools automatically. To work around the problem, install Parallels Tools manually once the guest OS installation is complete.
- For some Linux distributions (for example, Red Hat Enterprise Linux 5.3), Parallels Tools may not be installed automatically. To work around the problem, install Parallels Tools manually once the guest OS installation is complete.
- When converting a Hyper-V virtual machine, Parallels Server Bare Metal may fail to automatically install Parallels Tools in the resulting Parallels virtual machine. To work around the problem, install Parallels Tools manually.
- Migrating a Xen virtual machine may fail because the firewall in the virtual machine blocks connections to the Parallels Agent. To work around the problem, make sure that the firewall is configured to allow connections to the Parallels Agent.

- Migrating running virtual machines with empty hard disk drives is not supported.
- Migrating a running virtual machine may fail if it has only one SATA disk drive and no other SATA devices are connected to the virtual machine. To work around this problem, connect another SATA device to the virtual machine (for example, a SATA CD/DVD-ROM drive).
- Migrating physical computers with system volumes formatted with ReiserFS is not supported.
- Migrating containers running the 64-bit version of openSUSE 11.x to virtual machines is not supported.
- You may fail to hot-plug memory into a virtual machine if it is allocated 1 GB or less RAM and some application in the virtual machine is intensively using the memory.
- Sometimes, you may fail to hot-plug memory into virtual machines running the x64 version of Windows Server 2008 R2 with Service Pack 1.
- A guest operating system may report fewer CPUs than were really hot-plugged into the virtual machine.
- Incorrect I/O statistics may be reported for a container or virtual machine if it is allocated more than 25% of the total memory on the physical server. To work around the problem, reduce the amount of memory assigned to the container or virtual machine.
- The X server may fail to start in Parallels virtual machines created by converting a VMware ESXi virtual machine. To work around the problem, open the *Xorg.conf* file for editing and configure the virtual machine to use a standard VGA driver instead of the ESXi one.
- Virtual machines created on servers running Parallels Server Bare Metal 5.0 cannot be restored on servers with Parallels Server 4 Bare Metal.
- The resulting size of a resized virtual hard disk may slightly exceed the expected value.
- Not all snapshots of a virtual machine may be saved in a virtual machine backup.
- You cannot log in to a virtual machine using Parallels Power Panel if the virtual machine is located on a LVM volume.
- The network settings of a Xen virtual machine are not preserved when you convert it to a Parallels virtual machine. To work around the problem, configure the virtual machine network settings once the conversion is complete.
- You cannot start a virtual machine if it is mounted in read-only mode.

8. CONTACT INFORMATION

Product Web site: <http://www.parallels.com>

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