HP Virtualization Performance Viewer

Software Version: 2.20
Linux operating system

Installation Guide

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Chapter 1: Introduction

HP Virtualization Performance Viewer (HP vPV) is a web-based analysis and visualization tool that analyzes performance trends of elements in virtualized environments. It enables virtualization monitoring by providing an overview of the environment, near-real-time and historical data analysis and triaging using an interactive dashboard. It also enables monitoring for cloud and hypervisor environments. HP vPV helps you visualize performance data for elements in the context of each other to rapidly analyze bottlenecks. HP vPV provides performance monitoring, graphing, and reporting in a single interface.

Key features of HP vPV are as follows:

- Monitor the health and performance of the virtualized environment from Dashboard view.

- Triage analysis with the Workbench and capability to trend server utilization across days, weeks, and a month.

- Proactive monitoring of the entities that may cause disruptions in the environment. Use Treemap to identify and view the problems at a glance.

- Analyze the capacity, usage, and allocation trends for various resources in a virtualized environment.

- Right sizing recommendation based on historical resource utilization and reclaiming unused resources.

- Analyze the impact of increasing the workload.

- Determine the impact of adding or deleting resources in your environment.

- Estimate the future capacity utilization in order to proactively plan your hardware requirements.

- Group VMs, hosts, and datastores into Business Groups for collective analysis in Treemap, Workbench, and Forecast.

Conventions Used in this Document

The following conventions are used in this document when referring to the location of files on the HP Virtualization Performance Viewer (HP vPV) system:

Convention	Description	Value
<install_dir>	The directory where HP vPV is installed.	On Linux systems, the installation directory is `/opt/OV`.
<data_dir>	The common data directory where data files and log files related to HP Software products are stored.	The data directory is `/var/opt/OV`.

Chapter 2: Installation Requirements

During installation, the installer performs the following tasks:

- Checks if your system meets the disk space requirements. For information on the disk space, see "Hardware Requirements".

- Checks if your system has any other HP software product installed. For example: HP vPV co-exists with HP Operations Agent version 11.14.

- Provides a detailed log of the system disk space and other HP software products detected.

- Provides a list of components installed.

> **Note:** HP vPV supports only x64-bit version of the Linux operating system.

The location of the following files used for HP Operations agent co-existence has been changed:

File Name	Old Location	New Location
Viserver.properties	/var/opt/perf	/var/opt/OV/conf/PV
VILog4j.xml	/var/opt/perf	/var/opt/OV/conf/PV
pvcd.jar	/opt/perf/bin/java	/opt/OV/lbin/PV/java
log4j-1.2.17.jar	/opt/perf/bin/java	/opt/OV/lbin/PV/java

> **Note:**
>
> - The common jars are moved to `/opt/OV/lbin/PV/java`. The jars specific to a technology are part of its SMEPack. For Example: jars required by VMWARE collector are present in the **java** folder within the **VMWARE** SMEPack.
>
>   `/opt/OV/newconfig/OVPM/smepack/VMWARE/java`
>
> - The configuration file `OVPMconfig.ini` has become obsolete and is no longer being used.

Hardware Requirements

The minimum hardware requirements for installing HP vPV are:

Item	Value
CPU	2 vCPU
Memory	4 GB
Disk	66 GB
/opt/	700 MB
/var/opt/OV	50 GB

Installing on a slower system or one with less memory may result in slow performance.

The following table lists the hardware requirements for using HP vPV with the Premium and Express licenses:

License	vCPU	RAM	Disk Space	Instances Monitored
Express	2	4 GB	66 GB	2000[*]
Premium	2	4 GB	66 GB	1000

[*]HP vPV can monitor more than 2000 instances by increasing the RAM and CPU. For more information, see the *HP Virtualization Performance Viewer Sizing Guide*.

Supported Browsers

The following table lists the web browsers that are required to access HP vPV:

Operating Systems	Supported Browsers
Microsoft Windows	Firefox 24 (ESR)
	Internet Explorer 10
	Internet Explorer 9 (limited support)
	Google Chrome (latest version)
Linux	Firefox 24 (ESR)

To view the HP vPV home page, install Adobe® Flash Player 10.2 or above and enable JavaScript support for the Internet Explorer (IE) or Mozilla Firefox browser by adding HP vPV to your list of Trusted Sites.

Support Matrix

The following table lists the support matrix for HP vPV:

Deliverable	Platforms/Versions
Linux Installer	RHEL 6.4 (64-bit), 6.5 (64-bit)
	CentOS 6.4 (64-bit), 6.5 (64-bit)
	Oracle Enterprise Linux 6.5 (64-bit) (Red Hat compatible kernel)
	HP vPV does not support the unbreakable kernel (kernels with a uel/uek suffix).
Virtual appliance	CentOS 6.5

Chapter 3: Upgrading HP vPV from Earlier Versions to HP vPV 2.20

You can upgrade HP vPV to version 2.20 only from versions 2.01 and 2.10. The following table lists the supported upgrade scenarios:

Upgrade Scenario	Procedure
Upgrade HP vPV from version 2.10 to version 2.20	You can upgrade to HP vPV 2.20 in the following two ways: • Upgrading HP vPV using the Installer • Upgrading HP vPV using the Virtual Appliance
Upgrade HP vPV from version 2.01 to version 2.20	You can upgrade to HP vPV 2.20 in the following two ways: • Upgrading HP vPV using the Installer • Upgrading HP vPV using the Virtual Appliance

Note: You can upgrade HP vPV *only* from version 2.01 and 2.10 to 2.20. Upgrading HP vPV takes a significant amount of time. You cannot directly upgrade HP vPV from versions 1.00, 1.10, 1.20, or 2.00 to version 2.20. Also, make sure that you take a snapshot of HP vPV 2.01 or 2.10 machine before upgrading to 2.20 as rollback is not supported.

Upgrading HP vPV using the Installer

If you are already having an earlier version of HP vPV installed in your environment and want to upgrade to version 2.20, you can upgrade using **.tar** file. Download the **.tar** file on your local machine and install HP vPV on the VM.

To install HP vPV on a VM, see "Install HP vPV on Linux Nodes" on page 18.

Note: HP vPV recommends that you restart your system after upgrade. After the restart, you must start the HP vPV server by running the following command at the command prompt:
```
pv start
```

Upgrading HP vPV using the Virtual Appliance

If you already have an earlier version of HP vPV deployed on the virtual appliance and want to upgrade to version 2.20, you can do it in the following two ways:

- **"Using CDROM Updates (Using .iso)"**

- **"Using Specified Repository (Using .zip)"**

Using CDROM Updates (Using .iso)

1. Log on to VMware vSphere Client.

2. In the left tree pane, select the HP vPV machine that is to be upgraded.

3. Click the **Connect/disconnect CD/DVD devices of the virtual machine** icon. Select **CD/DVD drive1**.

4. Click **Connect to ISO image on local disk**. Windows Explorer appears.

5. Select the HPPV_VA_2.20.xxx_UPDATE.iso file. Click **Open**.

6. In the HP vPV interface, click the **Settings** icon.

7. Launch the HP vPV Virtual Appliance Management web interface using the **Launch vPV Virtual Appliance Management** link.

8. Log on to the HP vPV Virtual Appliance using the username as **root**. The default password is **vperf*viewer**.

9. Click **Update** tab. The **Update Status** page appears.

10. Click **Settings**. The **Update Settings** page appears.

11. In the **Update Repository** section, select **Use CDROM Updates**.

12. Click **Status**. The **Update Status** page appears.

13. Click **Check Updates**. The available updates appear.

14. Select the update and click **Install Updates**. The upgrade process begins.

15. After the upgrade process is complete, 'HP vPV 2.20 upgrade has been successfully completed.' message appears.

16. Log on to the HP vPV machine where version 2.20 has been installed.

17. Go to the command prompt and run the following commands to update the OpenSSL software used by VMware on the HP vPV machine:

```
yes | cp -f /usr/lib64/libssl.so.1.0.1e /opt/vmware/lib/libssl.so.0.9.8

yes | cp -f /usr/lib64/libssl.so.1.0.1e  /opt/vmware/lib/libssl.so.0.9.8r

yes | cp -f /usr/lib64/libcrypto.so.1.0.1e /opt/vmware/lib/libcrypto.so.0.9.8

yes | cp -f /usr/lib64/libcrypto.so.1.0.1e /opt/vmware/lib/libcrypto.so.0.9.8r

/etc/init.d/vami-sfcb restart

/etc/init.d/vami-lighttp restart
```

The OpenSSL software is updated with the latest updates.

Using Specified Repository (Using .zip)

1. Download and unzip HPPV_VA_2.20.xxx_UPDATE.zip in the Web folder at the server (Web or FTP) location.

2. In the HP vPV interface, click the **Settings** ⚙ icon.

3. Launch the HP vPV Virtual Appliance Management web interface using the using the **Launch vPV Virtual Appliance Management** link.

4. Log on to the HP vPV Virtual Appliance using the username as **root**. The default password is **vperf*viewer**.

5. Click **Update** tab. The **Update Status** page appears.

6. Click **Settings**. The **Update Settings** page appears.

7. In the **Update Repository** section, select **Use Specified Repository**.

8. In the **Repository URL** box, type the server (Web or FTP) location where the update file was unzipped.

9. In the **Username** and **Password** box, type the User name and Password, if any.

10. Click **Save Settings**.

11. Click **Status**. The **Update Status** page appears.

12. Click **Check Updates**. The available updates appear.

13. Select the update and click **Install Updates**. The upgrade process begins.

14. After the upgrade process is complete, 'HP vPV 2.20 upgrade has been successfully completed.' message appears.

15. Log on to the HP vPV machine where version 2.20 has been installed.

16. Go to the command prompt and run the following commands to update the OpenSSL software used by VMware on the HP vPV machine:

```
yes | cp -f /usr/lib64/libssl.so.1.0.1e /opt/vmware/lib/libssl.so.0.9.8

yes | cp -f /usr/lib64/libssl.so.1.0.1e  /opt/vmware/lib/libssl.so.0.9.8r

yes | cp -f /usr/lib64/libcrypto.so.1.0.1e /opt/vmware/lib/libcrypto.so.0.9.8

yes | cp -f /usr/lib64/libcrypto.so.1.0.1e /opt/vmware/lib/libcrypto.so.0.9.8r

/etc/init.d/vami-sfcb restart

/etc/init.d/vami-lighttp restart
```

The OpenSSL software is updated with the latest updates.

> **Note**: The VAMI web server configuration gets modified while upgrading a previous version of HP vPV to the latest version. The original configuration gets backed up before the modification. If you want to revert to the previous VAMI configuration, perform the following steps:
>
> 1. Log on to the HP vPV virtual appliance as root.
>
> 2. Run the following commands:
>
>    ```
>    cp /opt/vmware/etc/lighttpd/lighttpd.conf.vPV cp
>    /opt/vmware/etc/lighttpd/lighttpd.conf
>
>    /etc/init.d/vami-lighttp restart
>    ```

Verify the Upgrade

You can verify the upgrade to HP vPV version 2.20 by performing either of the following:

- In the HP vPV interface, go to the Help icon and click **About HP vPV**. A dialog box appears with the version information.

- Verify the version by running the following command at the command prompt:

  pv version

> **Note:** After the upgrade, it is recommended to check the status of HP vPV processes using

the following command:

/opt/OV/bin/ovc

If any of the processes are not running, run the following command to restart the processes:

pv restart

Chapter 4: Installing HP vPV

The following section details the different methods to install HP vPV:

- "Deploy the HP vPV Virtual Appliance"

- "Install HP vPV on Linux Nodes"

Note: HP vPV supports direct upgrade *only* from version 2.01 and 2.10 to version 2.20.

Open Port Requirements

HP vPV requires the following ports to be open on the firewall:

Port	Protocol	Description
8081	HTTP	To make HP vPV accessible from the remote browser, if there is a firewall on the system where HP vPV is installed.
8444	HTTPS	To access HP vPV in Hypertext Transfer Protocol Secure mode.
5480, 5488, and 5489	HTTPS	To access the Virtual Appliance Management Interface (VAMI). If you are not performing HP vPV Virtual Appliance upgrade, it is recommended to keep the port 5489 disabled.
383	HTTPS	For HP vPV internal communication process.
5433	HTTPS	For HP vPV database requirements (HP Vertica).
443	HTTPS	To ensure data collection from VMware vSphere targets.
5671	HTTPS	To ensure data collection from HP OneView targets.
135	TCP	To ensure data collection from Hyper-V targets. Port between Windows proxy system and Hyper-V host should be open on Hyper-V host.
8100	HTTPS	To ensure data collection from SCVMM targets. Port between Windows proxy system and SCVMM host should be open on the SCVMM host.

Port	Protocol	Description
22	SSH	To ensure data collection from KVM and Xen targets.
35357 (Admin), 8774 (Nova)	HTTPS	To ensure data collection from OpenStack targets.

Deploy the HP vPV Virtual Appliance

HP vPV is available as a Virtual Appliance for easy deployment in vCenter. You can use the VMware vSphere Client user interface to deploy the virtual appliance.

The supported VMware vCenter Server versions are 5.0, 5.1, 5.5, and 6.0.

To deploy the HP vPV virtual appliance, follow these steps:

1. Open VMware vSphere Client.

2. Type the credentials and click **Login**.

3. Select **File > Deploy OVF Template**. The **Deploy OVF Template** window opens.

4. Click **Browse** to browse to the location where you have saved the HP vPV virtual appliance file.

5. Click **Next**. The window shows the details of virtual appliance.

6. Click **Next**. The End User License Agreement details appear.

7. Click **Accept** and then click **Next**.

8. Type a name for the virtual appliance in the **Name** field.

9. Select where to deploy the virtual appliance from the **Inventory Location** tree. Click **Next**.

10. Select the host or cluster where you want the virtual appliance to run. Click **Next**.

11. Select the specific host where to run the virtual appliance. Click **Next**.

12. Select the storage location where you want to store the virtual machine files. Click **Next**.

13. Select the disk format in which you want to store the virtual disks. Click **Next**.

14. Type the required Networking Properties and click **Next**. The window shows the details of the deployment.

15. Select the **Power on after deployment** check box.

16. Click **Finish**. The deployment task starts. After deployment, the virtual appliance name appears in the tree in the VMware vSphere Client user interface.

Note: For more information, see the VMware documentation. The steps are subject to change based on VMware.

Logging in to the Virtual Appliance

You can log in to the HP vPV Virtual Appliance using the username as **root**. The default password is **vperf*viewer** and it is recommended to change the password after logging in.

Install HP vPV on Linux Nodes

Prerequisites for Linux-Based Installer

Following are the prerequisites for the Installer version of HP vPV:

- Install Libvirt and all its dependencies on the HP vPV server.

  Libvirt is an open source management tool to manage virtualized platforms such as Linux, KVM, Xen, and so on.

  Libvirt can be installed on following versions of the different Linux distributions:

Linux Types	OS Versions
CentOS	6.4 (64-bit)
	6.5 (64-bit)
RHEL	6.4 (64-bit)
	6.5 (64-bit)
Oracle Enterprise Linux	6.5 (64-bit) (Red Hat compatible kernel)
	HP vPV does not support the unbreakable kernel (kernels with a uel/uek suffix).

- Install Expect and all its dependencies on the HP vPV server.

  Expect is a tool that communicates with interactive programs such as ssh.

- For HP vPV standalone installation, install latest unixODBC package, if it is not already available.

  The unixODBC Driver Manager is an open source ODBC driver manager for providing application developers predictable APIs to access Datasources.

- Ensure that the host name assigned to RHEL is a Fully Qualified Domain Name (FQDN) and is resolvable by DNS. If DNS is not configured in the environment, add the IP address machine name mapping in the /etc/hosts file.

- To install HP vPV, the following runtime libraries and packages are required:

  - On x64 systems:

    - glibc-2.3.4-2.36.i686.rpm

    - libgcc-3.4.6-8.i386.rpm

    - libstdc++-3.4.6-8.i386

    - libtool-ltdl-2.2.6-15.5.el6.x86_64.rpm

    - unixODBC-2.2.14-12.el6_3.x86_64.rpm

    - ntpdate-4.2.6p5-1.el6.x86_64.rpm

    - libedit-2.11-4.20080712cvs.1.el6.x86_64.rpm

    - ntp-4.2.6p5-1.el6.x86_64.rpm

    - gdb-7.2-60.el6_4.1.x86_64.rpm (for installing pstack)

    - mcelog-1.0pre3_20120814_2-0.13.el6.x86_64.rpm

    - sysstat-9.0.4-22.el6.x86_64.rpm

  - To check the packages, use the following command:

    ```
    rpm -qa | grep -i <packagename>
    ```

    In this instance, `<packagename>` is the name of the package to be checked for.

  - C++ runtime:

    - For systems with kernel version 2.6:

      /usr/lib/libstdc++.so.5

    - For systems with kernel version 2.6 on Itanium :

      /usr/lib/libstdc++.so.6

  - Curses runtime library:

    /usr/lib/libncurses.so.5

  - unixODBC runtime library:

    /usr/lib64/libodbc.so

  - Make sure that the m4 utility is installed at the path **/usr/bin/m4**.

- Set the executable (x) bit for the libvirt library at one of the following paths as appropriate for your environment:

  - **/usr/lib64/libvirt.so**

  - **/usr/lib64/libvirt.so.0**

  - **/usr/lib/libvirt.so**

  - **/usr/lib/libvirt.so.0**

- To set the timezone, run the following command:

  ```
  # env | grep TZ

  TZ=EST5EDT
  ```

Prerequisites for HP Vertica:

- HP Vertica does not support Logical Volume Manager (LVM) on any drive where database files are stored. HP vPV installer will exit if `/var/opt/OV` partition is LVM.

- Linux Filesystem type must be either **ext3** or **ext4**. All other filesystem types are not supported.

- HP Vertica does not support SELinux except when SELinux is running in permissive mode.

- `/var/opt/OV` partition should have a minimum disk space of 50 GB.

- Swap partition of at least 2 GB or larger is required irrespective of the amount of RAM installed on the system.

- Minimum 1 GB of RAM per logical processor.

For more information on the Pre-requisites for HP Vertica, see *HP Vertica Analytic Database Installation Guide*

You can install HP vPV by using any of the following procedures:

- "Attended Installation"

- "Unattended Installation"

Note: To install HP vPV on your system, you must log on as root user.

Attended Installation

To install HP vPV through Graphical and command line interface, follow these steps:

Installing HP vPV through Graphical Interface

To install HP vPV using X11 interface, perform the following tasks:

1. Login as a root user.

2. Download the **.tar** file. Extract the contents of the **.tar** file.

3. To start installation, if you want to use the X11 terminal window, export the DISPLAY variable to point to an X11 terminal type the following command:

   `export DISPLAY=<IP_Address/system_name>:0.0`

   where, *<IP_Address/system_name>* is the IP address or the system name of the X11 terminal.

4. Type the following:

   <Directory where the tar file is extracted>/HPPV_2.20.xxx_setup.bin

   The HP vPV Installation wizard appears. This window displays an introductory message.

   > **Note:** If you are installing HP vPV for the first-time on your Linux system, the `ovinstallparams.ini` file containing the installation parameters is created in the system's `temporary` directory. During installation, HP Installer checks for the `ovinstallparams.ini` file. If HP Installer detects the `ovinstallparams.ini` file on your system, a message asking if you want to reuse the values in the file appears.
   >
   > - Click **Yes** to use the values in the configuration file as default values.
   >
   > - Click **No** to overwrite the existing configuration file.
   >
   > If HP Installer does not find the file, the system creates the `ovinstallparams.ini` file with default values in the `temporary` directory. To save the `ovinstallparams.ini` data, copy the file to an alternate location, before installing other HP products.

5. On the HP vPV Installation wizard, click **Next**. The License Agreement screen appears.

6. Read the terms of license agreement. To continue with installation, select **I accept the terms of License Agreement** option. The installation wizard performs install checks.

7. Click **Next**. The Pre-Install Summary screen appears. The screen displays the list of components that will be installed.

   > **Note**: If HP vPV version 2.01 or 2.10 is present on the system, you would asked to do a forced re-installation of already installed component packages.

8. Click **Install**.

> **Note:** If the installation fails, you can roll back or quit installation. The **Roll Back** option removes the components which are already installed.
>
> Clicking **Quit** stops the installation, but does not uninstall the components installed till then.
>
> When you start HP vPV installation next time, the Installer prompts you to confirm if you want to resume the installation or uninstall HP vPV.

9. Click **Details** tab and expand the components tree to view the list of components.

10. To view the log file on your system, click **View Log Files.**

11. Click **Done** to complete the installation.

> **Note:** If the system needs to be restarted, the following message appears after installation is complete: 'You may need to restart your system for the configuration changes made to the system to take effect. Would you like to quit this installation?'.
>
> It is recommended that you restart your system after installation.

Installing HP vPV through Command Line Interface

> **Note:** Localization is not supported when installing HP vPV in console mode. As a result, some text may be illegible.

To install HP vPV through Command Line interface, follow these steps:

1. Login as a root user.

2. Download the **.tar** file. Extract the contents of the **.tar** file.

3. Run the following command:

   If you are installing HP vPV on a stand-alone system:

   <Directory where the tar file is extracted>/**HPPV_2.20.xxx_setup.bin -i console**

   If you have configured the locale of the system to one of the following languages: English, Japanese, and Simplified Chinese, the installer prompts you to select the language at the beginning of the installation. You will have the option of choosing the language to which your system locale is set. If the system locale is set to any other language apart from these, the installer displays only 'English'.

4. When the prompt, **I accept the terms of the License Agreement** for the License information appears, type **Y** to accept the terms and continue installation. The installer checks all the Install Requirements.

5. Click **Enter** to continue. The pre-installation summary appears.

> **Note**: If HP vPV version 2.01 or 2.10 is present on the system, you would asked to do a forced re-installation of already installed component packages. Select Yes to continue.

6. Click **Enter** to continue.

   When the installation is complete, you will receive a message which states that the installation was completed successfully.

Unattended Installation

To perform unattended installation, follow these steps:

1. Login as a root user.

2. Download the **.tar** file. Extract the contents of the **.tar** file.

3. Go to the directory where the **.tar** file is extracted.

4. Type the following syntax at the command prompt:

   ./HPPV_2.20.xxx_setup.bin -i silent

   > **Note:** If the installer finds a working installation of HP vPV, it will uninstall HP vPV when you run the `-i silent` command. If not, it will install HP vPV.

5. To verify the installation, check the log files.

You can view the HP vPV installer log file at `/tmp/HPOvInstaller/HPPVInstallLog.txt`

Verify the Installation

On successful installation:

- The Linux systems display the application directory and data directory paths.

- To view install log files see the following:

   For Linux: `/tmp/HPPV_2.xx.xxx_HPPVInstaller.txt`

   `/var/tmp/HPOvInstaller/PerfUtil-mm-dd-yyyy.log.0`

In this instance, mm indicates the month, dd indicates the day, and yyyy indicates the year. The file name indicates the time stamp when the install was performed.

Chapter 5: Getting Started

After installing HP vPV, you can start using the product by accessing the user interface. To launch HP vPV, you can use the following URL:

https://<*system_name*>:<*port*>/PV

In this instance,

systemname is the IP address or host name of the machine on which HP vPV is configured.

port is port number on which HP vPV is configured. The default port number is 8444.

PV is case sensitive.

> **Note:** If you access HP vPV using the HTTP protocol (**http://<systemname>:<port>/PV**), you are automatically redirected to the secure HP vPV URL (**https://<systemname>:<port>/PV**).

If authentication is enabled, log in using the user name and password. The Admin page opens for the first time.

To start using the product, add the data sources to be monitored. For more information on adding data sources, see the *HP Virtualization Performance Viewer Online Help*.

Chapter 6: Configuring HP vPV

The following section details different methods to configure HP vPV:

- Configure Secure Communication with Tomcat Server

- Add a vCenter server running on a non-default port

Configure Secure Communication with Tomcat Server

The HTTPS protocol is by default enabled for HP vPV. The default port number for HTTPS is 8444. To access HP vPV in the secure mode, use the following URL:

https://<systemname>:8444/PV

You can also change the default port settings for HTTPS communications.

Changing Port Settings

The default HTTPS port number to access HP vPV is 8444. All client systems are authorized to connect to HP vPV server. To change the default port number for the HP vPV server, follow these steps:

1. Check for the availability of the port number you want to use, by running the following commands at the command prompt:

   cd <bin_dir>

   ovtomcatbctl -checkport <portnumber>

   A message indicating if the port is available or in use appears. For example, if you are checking for the availability of the port number 8444, the message, "Port Number 8444 is not in use" appears, if the port number is available. If the Port Number 8444 is not available, a message indicating that the port number is used by another program or service appears.

2. Stop HP vPV by running the following command at the command prompt:

   pv stop

3. To change https port numbers for HP vPV server, run the following command at the command prompt:

   cd <bin_dir>

   ovconfchg -ns NONOV.TomcatB -set HTTPPort <port number>

ovconfchg -ns NONOV.TomcatB -set HTTPSPort <port number>

4. Start the HP vPV server by running the following command at the command prompt:

   pv start

Using SSL or HTTPS with the Tomcat Web Server

To use SSL or HTTPS protocols with the Tomcat web server, you need to obtain a server certificate for Tomcat after installing HP vPV. You can replace the certificate obtained after HP vPV installation in the following scenarios:

- When you connect to HP vPV using HTTPS protocol, the certificate and name of the system are compared to ensure that the names match. If the names are not similar, most browsers alert the users so that they can decide to either continue or cancel the connection. If the name used by HTTPS users is different from the name used by the HP vPV installation, you must obtain a different certificate.

- You may need to obtain a new certificate when you want to fill the fields in the certificate that are left blank during HP vPV installation. The certificate contains many fields to provide information, such as, the issuer of the certificate and other fields that warrant the safety provided by the certificate. The HP vPV installation certificate leaves most of these fields blank.

- When you want to change the default certificate password to avoid unauthorized changes, you must replace the existing certificate.

To replace the Tomcat SSL certificate, perform the following steps:

1. Delete the existing certificate by running the following command at the command prompt.

   keytool -delete -alias ovtomcatb -keystore /var/opt/OV/certificates/tomcat/b/tomcat.keystore

   The keytool path on Linux is */opt/OV/nonOV/jre/b/bin*

   > **Note:** The password for deleting the certificate is `changeit`.

2. Restart HP vPV.

3. Create a new certificate. To create a new certificate, run `Keytool` by entering the following commands at the command prompt:

   *keytool -genkey -alias ovtomcatb -keyalg RSA -keystore
   /var/opt/OV/certificates/tomcat/b/tomcat.keystore*

4. Restart HP vPV.

Add a vCenter server running on a non-default port

vCenter Server system requires port 443, for connections from the vSphere and Software Development Kit (SDK) clients. By default, vCenter collector of HP vPV 2.20 uses port 443 for data collection from vCenter server. If this default port 443 is re-configured in your environment due to any reason, it is recommended to use the `iptables` to route the traffic.

During the HP vPV 2.20 installation, run the `iptables` command and setup port forwarding rules for each of the target.

Follow the steps:

1. Log on as a root user.

2. Run the following command:

   ```
   iptables -t nat -A OUTPUT -p tcp -m tcp -d <target vcenter(s) ip> --dport 443 -
   j DNAT --to-destination <target vcenter(s) ip>:<target port>
   ```

   In this instance, **<target vcenter(s) ip>** is the ip address of the target vCenter and **<target port>** is the port number of the target.

Using HP vPV Commands

After you install HP vPV, you can use the following commands to administer the HP vPV workspace through the command prompt.

<bin_dir>/pv <Options>

You can replace *<Options>* with any of the following variables:

- **status** - To check the HP vPV status.

- **start** - To start HP vPV.

  All the applications that use OvTomcatB are started when you run **pv start** command.

- **stop** - To stop HP vPV.

  All the applications that use OvTomcatB are stopped when you run **pv stop** command.

- **restart** - To stop and then start HP vPV.

- **trace on** - To start generating detailed trace files.

- **trace off** - To stop generating detailed trace files.

- **version** - To display the version of HP vPV installed on your system.

Configuring HP vPV to Communicate with Remote HP Vertica

You can configure HP Virtualization Performance Viewer to communicate with a remote instance of HP Vertica.

Follow these steps to configure HP Virtualization Performance Viewer to communicate with a remote instance of HP Vertica.

On the machine where a database instance of HP vPV is to be created:

1. To create a database instance login to HP Vertica system, run the following command:

   `su <dbadminuser> -c "/opt/vertica/bin/adminTools -t create_db -s <hostname> -d pv -c <Vertica_DB_Path>/catalog -D <Vertica_DB_Path>/data"`

   In this instance,

   the `dbadminuser` is the database administrator user.

   the `hostname` is the host name or IP address of HP Vertica system.

   the `Vertica_DB_Path` is the database path of HP Vertica.

   For example, `su dbadmin -c "/opt/vertica/bin/adminTools -t create_db -s 10.20.10.1 -d pv -c /vertica_disk/catalog -D /vertica_disk/data"`

2. Create HP Vertica user. Run the following commands in sequence to create HP Vertica user with access to public schema:

   ○ `su <dbadminuser> /opt/vertica/bin/vsql —c "CREATE USER <UserName> IDENTIFIED BY '<Userpassword>'"`

   ○ `su <dbadminuser> /opt/vertica/bin/vsql —c "GRANT ALL ON SCHEMA PUBLIC to <UserName>"`

   In this instance,

   the `dbadminuser` is the database administrator user.

   the `UserName` is the user name for the database instance.

   the `Userpassword` is the password for database instance.

On HP vPV system:

1. Log on as root user.

2. Run the following command to stop **ovtomcatB** and **pvcd** processes:

   `/opt/OV/bin/ovc -stop`

3. Run the following command to stop the local HP Vertica instance:

   `/opt/OV/bin/pv_vertica stop`

4. Go to `/var/opt/OV/conf/perf/`

5. Open the **PVHibernate.props** file. Edit the following attributes in **PVHibernate.props** file:
   a. Set `hibernate.connection.url = jdbc:vertica://<IP Address>:<Port Number>/pv`

   In this instance,

   the `IP Address` is the IP address of remote HP Vertica instance

   > **Note**: If HP Vertica is installed on a cluster, the `IP Address` is the virtual IP address of the respective cluster.

   the `Port Number` is the port number of remote HP Vertica instance.

   b. Set `hibernate.connection.username=<User Name>`

   In this instance,

   the `User Name` is the user name of remote HP Vertica instance.

   c. Set `hibernate.connection.password=<Password>`

   In this instance,

   the `Password` is the `encrypted` password of remote HP Vertica instance.

   > **Note**: To get the encrypted password, run the following command:
   > `pvconfig -en <password>`
   > In this instance, `password` is the decrypted password of remote HP Vertica instance.

6. Run the following commands to update the user name, password, and connection string in the configuration database:

   a. `ovconfchg -ns pvcd.dml -set username "<User Name>"`

   In this instance,

the `User Name` is the user name of remote HP Vertica instance.

b. `ovconfchg -ns pvcd.dml -set password "<Password>"`

In this instance,

the `Password` is the `encrypted` password of remote HP Vertica instance.

> **Note**: To get the encrypted password, run the following command:
> `pvconfig -en <password>`
> In this instance, `password` is the decrypted password of remote HP Vertica instance.

c. `ovconfchg -ns pvcd.dml -set ConnectionString "DSN=Vertica;SERVERNAME=<IP Address>;PORT=<Port Number>;"`

In this instance,

the `IP Address` is the IP address of remote HP Vertica instance

> **Note**: If HP Vertica is installed on a cluster, the `IP Address` is the virtual IP address of the respective cluster.

the `Port Number` is the port number of remote HP Vertica instance.

7. Run the following commands in sequence to create database schema on HP vPV system:

   ○ `/opt/OV/bin/pvsql -f /opt/OV/newconfig/OVPM/vertica/CreateTables_Vertica.sql`

   ○ `/opt/OV/bin/pvsql -f /opt/OV/newconfig/OVPM/vertica/DummyData_Vertica.sql`

   ○ `/opt/OV/bin/pvsql -f /opt/OV/newconfig/DataDir/conf/PV/Model/DMLMetaMetaSchema`

   ○ `/opt/OV/bin/pvsql -f /var/opt/perf/syspulse/scripts/createtable.sql`

   ○ `/opt/OV/bin/pvsql -f /opt/OV/newconfig/OVPM/vertica/Create_Custom_ Projections.sql`

8. Run the following command to start HP vPV processes:
   • `/opt/OV/bin/pvconfig –um`

   • `/opt/OV/bin/ovc –start`

Chapter 7: License Management

After you install HP vPV, you can purchase the appropriate licenses based on your business requirements. These licenses enable you to access all the features of the product. To purchase the respective license, click **You have Evaluation/Community license. Click to buy license link.** The link navigates to the **Buy License** page. Enter your details in the **Contact Me** tab and click **Submit**. Make sure email client is configured in your browser.

To access the License option on the HP vPV user interface:

1. Log on to the HP vPV user interface.

2. Click the **Settings** icon.

   The Settings page appears.

3. In the Settings page, click the **License** option.

   The License page appears.

The License page provides information about your HP vPV licenses. You can also use this tab to start using your Evaluation License as well as import a HP vPV license. For more information on importing licenses, see "Importing Licenses".

> **Note:** If you install an Express license on the HP vPV server which uses a Community license, then the Express license overrides the Community license.
>
> If you want to retain the Community license, create a separate HP vPV server to install the Express license.

For more information on the difference between the licenses and the features available, see "Types of Licenses"

User Interface

The following table lists the sections available in the License option.

Section	Description
License Status	The License Status section lists the following information about your current HP vPV license: • Maximum number of OS instances that are provided by the active licenses • Number of OS instances that are currently being monitored by the active licenses • Data Retention • If you have a Server Instance License enabled, you can see the total Server Instance capacity, the current Server Instance Count, and the OS instances that are covered by the Server license. • License alert threshold
Installed License List	The Installed Licenses List section lists the following information regarding the active and all installed licenses for HP vPV. • Type of license installed • Date of license expiry

Note: The number of OS instances denote only the VMs and hosts.

Types of Licenses

HP vPV offers the following licenses: Community, Express, Premium, Evaluation, Monitoring Only, and Server Instance Licenses.

Note: The maximum number of OS instances that can be monitored by a Community license is 25. The number of OS instances denote only the VMs and hosts. HP vPV recommends monitoring up to 10,000 OS instances using Express, Premium, and Evaluation license. However, larger configurations can be supported. For more information, see the HP vPV Sizing Guide. The Monitoring Only license supports unlimited number of OS instances.

The following table lists the available features for the HP vPV Licenses:

Feature	Community License	Express License	Premium License	Evaluation License	Monitoring License	Server License
Data Retention	Up to 24 hours	90 days	90 days	60 days	8 Days	90 days

Feature	Community License	Express License	Premium License	Evaluation License	Monitoring License	Server License
License Entitlement Period	Perpetual	Perpetual/Term	Perpetual/Term	60 days	Perpetual	Perpetual
Enterprise Directory Integration	No	Yes	Yes	Yes	No	Yes
Reports	Yes	Yes	Yes	Yes	No	Yes
HP OM, HP OMi, HP PM and HP BSM Integration	No	Yes	Yes	Yes	Yes	Yes
Monitoring	No	Yes	Yes	Yes	Yes	Yes
HP CSA Integration	No	No	Yes	Yes	No	Yes
Business Grouping	No	No	Yes	Yes	No	Yes
HP OneView Integration	No	No	Yes	Yes	No	Yes
Monitoring Physical Servers	No	No	Yes	Yes	No	Yes
Guest Operating System drill down for advanced troubleshooting	No	No	Yes	Yes	No	Yes
Current Capacity Reports (Only for VMware™ vSphere, Microsoft™ HyperV, and KVM)	No	No	Yes	Yes	No	Yes

Feature	Community License	Express License	Premium License	Evaluation License	Monitoring License	Server License
Best-fit Capacity Optimization (Only for VMware™ vSphere, Microsoft™ HyperV, and KVM)	No	No	Yes	Yes	No	Yes
Virtual Machine Placement (Only for VMware™ vSphere, Microsoft™ HyperV, and KVM)	No	No	Yes	Yes	No	Yes
Capacity Demand Forecast (Only for VMware™ vSphere, Microsoft™ HyperV, and KVM)	No	No	Yes	Yes	No	Yes
Alerting (Only for VMware™ vSphere, Hyper-V, and KVM)	No	Yes	Yes	Yes	No	Yes
Capacity Modeler (Only for VMware™ vSphere, and KVM)	No	No	Yes	Yes	No	Yes
Dashboard	No	No	Yes	Yes	No	Yes

Note: The number of OS instances denote only the VMs and hosts.

All product features are available for the Evaluation License. The only difference between the Evaluation License and Premium License is the validity.

Evaluation License

After installing HP vPV, by default, your active license will be Community License. To start using HP vPV in evaluation mode, click **Start Evaluation**. The page refreshes and displays information regarding your Evaluation License.

After the Evaluation License expires (after 60 days), the system changes your license automatically to Community License.

You can enable the Evaluation License from the user interface and from the command line.

From User Interface:

To enable Evaluation License from the user interface, follow these steps:

1. Go to the **License** option in the **Settings** page.

2. Click the **Start Evaluation** link.

From Command Line:

To enable Evaluation License from the command line, follow these steps:

1. On the HP vPV machine, log on as a root user.

2. Run the following command to activate the Evaluation license:

   ```
   pv starteval
   ```

Note: Data collection works only when the sum of instances from all data sources is less than or equal to the maximum instance capacity of the license. If the total instance count exceeds the maximum instance capacity of the license, then the data collection stops for all the data sources. For example, if you install a Premium license for 100 instances, and try to connect two hosts with 60 instances each, then the collection fails for both the hosts.

Monitoring Only License

When HP vPV is integrated with HP Operations Manager/HP Operations Manager i (HPOM/OMi) and you want to use HP vPV's monitoring capabilities only, you can enable the Monitoring Only License. With the Monitoring Only license, you can only use limited set of features in the **Settings** option of HP vPV. All the other HP vPV features are disabled.

You can enable the Monitoring License from the user interface and from the command line.

From User Interface:

To enable Monitoring License from the user interface, follow these steps:

1. Go to the **License** option in the **Settings** page.

2. Click the **Start Monitoring Only** link.

From Command Line:

To enable Monitoring License from the command line, follow these steps:

1. On the HP vPV machine, log on as a root user.

2. Run the following command to activate the Monitoring Only license:

```
pv startmonitoringonly
```

The Evaluation, Premium, and Express licenses override the existing Monitoring license. After the end of respective license entitlement periods, HP vPV reverts to the Monitoring license features.

Similarly, if you are currently using HP vPV in evaluation mode, and you enable the Monitoring License, all the features would be available only for the evaluation period. After the Evaluation license validity expires, the Monitoring license continues to be active.

Server License

You can enable the HP vPV Server license to monitor the servers managed by HP OneView. A single Server license instance enables you to monitor all the OS instances running on the server covered by the Server license. A Server license is similar to the Premium license in terms of feature availability.

> **Note:** The maximum number of valid Server instance licenses cannot exceed the maximum servers managed by HP OneView.

The following table summarizes the behavior of HP vPV in the following license scenarios:

Currently Active License	License Applied	Behavior
Community/Evaluation/Monitoring Only/Express	Server License	The Server license overrides the existing license. The total licensed instance count equals the OS instances covered by the Server license. **Note**: The data collection will stop if there are OS instances that are running on the servers not covered by the Server license. To start the data collection, you can install additional licenses with sufficient capacity.

Currently Active License	License Applied	Behavior
Premium	Server License	The Server license co-exists with the Premium license. The total licensed instance count equals the OS instances covered by the Premium and Server license. **Note**: The OS instances that are running on the servers covered by the Server license will be deducted from the current OS instance count. This results in additional OS instance capacity.
Server License	Premium	The Server license co-exists with the Premium license. The total licensed instance count equals the OS instances covered by the Premium and Server license.
Server License	Community/Evaluation/Monitoring Only/Express	Not supported.

Note: If the number of servers managed by HP OneView exceeds the Server license capacity, the servers are chosen based on the number of instances associated with them. The servers having the highest number of instances are automatically selected to be monitored by the Server license.

Importing Licenses

After you purchase a license, you must import it before you start using HP vPV.

To import licenses for HP vPV, follow these steps:

1. Go to the **License** option in the **Settings** page.

2. In the **License Status** section, click the **Import License** link.

    The **Manage License** page appears.

3. Type your license key in the **License Key** field of the Manage License section.

4. Click **Import License.** The **Installed License List** section refreshes to display the details of the license imported.

    To clear the license key typed in, click **Reset**.

Chapter 8: Removing HP vPV

You can remove HP vPV installed on Linux systems by using the procedure described in the following section:

HP vPV Virtual Appliance

To remove the HP vPV virtual appliance, power off the VM and delete the VM.

Remove HP vPV from Linux Nodes

To remove HP vPV from a Linux system:

1. Log on as root user.

2. Go to `/opt/OV/Uninstall/HPPV.`

3. Run the uninstall command:

   - To use an X11 interface, export the `DISPLAY` variable to point to an X11 terminal if necessary. Then run the command:

     `./setup.bin`

   - To use a command line interface, run the command:

     `./setup.bin -i console`

4. Select **Uninstall**.

Removing Configurations and User Graph Templates

Removing HP vPV does not remove configurations or user graph templates. You need to manually remove the files from the data directory.

Removing HP vPV Files using the Clean-up Script

After removing HP vPV, you must run the following clean-up script. This script is available in the `<install_dir>\support`:

- `clnup_pv.sh` for Linux

The clean-up script removes the following files from `<data_dir>\conf\perf`:

- `PVconfig.ini`

- `OVPMUsers.xml`

- `OVPMSystems.xml`

- `ovpm.tcf`

- `VPI_GraphsUserFavorites.txt`

- `OVPMReportTemplate.htm`

- All folders starting with the name "`VPI_`".

- All PV database related files

Note: If you plan to reinstall HP vPV on the same system, make sure you delete the following folders after you finish running the clean-up script:

- /opt/OV/

- /opt/vertica/

- /var/opt/OV/

Chapter 9: Troubleshooting HP vPV

The following section details how to troubleshoot HP vPV:

Vertica database is filled to near capacity due to the increase in the log file size.

Symptom	The Vertica database is filled to near capacity due to the increase in the log file size.
Causes	Vertica database consolidates and retains the log data in a **.gz** file daily. By default, this process (called 'rotate') continues for 52 weeks.

Resolution	To create more space on the Vertica database implement any one of the two solutions below:
	
	Solution 1
	
	1. Go to **/opt/vertica/config/logrotate/**.
	
	2. Open the **pv** file.
	
	3. In the pv file, under **# and keep for 52 weeks** change the value of **rotate** from 52 to the number of weeks for which you want to save the rotated log files.
	
	    For example: **rotate 3**
	
	    In this instance, the Vertica database will retain the **.gz** files for 3 weeks.
	
	4. Repeat **step 3** for all instances of **# and keep for 52 weeks**.
	
	5. Save and close the file.
	
	Solution 2
	
	1. Login as a root user.
	
	2. Run the following commands on the HP vPV server:
	
	    `cd /opt/vertica/bin`
	
	    `./admintools -t logrotate -d pv -r weekly -k <number_of_weeks>`
	
	    where, *<number_of_weeks>* is the number of weeks for which you want to retain the rotated logs.

Unable to Access HP vPV

Symptom	Unable to access HP vPV through the default network port settings.

Causes	• Your system has **ovTomcatB** configured to run with the non-root user or non-local system account privileges and you have HP vPV installed on such a system. • You cannot access HP vPV using the default http (8081) or https (8444) ports if these ports are in use by other applications.
Resolution	• Check if **ovTomcatB** is configured to run with the non-root user or non-local system account privileges. If so, modify the settings to run **ovTomcatB** with the Administrator or root user privileges. • Try accessing HP vPV by using the following URL: `http://<IP address/system name>:<port number>/PV` where, *<IP address/system name>* is the IP address or the system name of the HP vPV server and *<port number>* is the port number of the HP vPV server. If the HP vPV Home page does not appear, check if the default ports are in use. • To change the port settings, follow these steps: 1. Run the following command at the command prompt to change the port numbers for HTTP, HTTPS, and ShutdownPorts: *<bin_dir>ovconfchg -ns NONOV.TomcatB -set HTTPPort <port number>* *<bin_dir>ovconfchg -ns NONOV.TomcatB -set HTTPSPort <port number>* *<bin_dir>ovconfchg -ns NONOV.TomcatB -set ShutdownPort <port number>* 2. Restart HP vPV.

Unable to connect to HP vPV server through HTTPS protocol

Symptom	HP vPV is unable to connect to the server through secure communication (HTTPS) protocol.
Cause	The connection times out when HP vPV is not able to connect through the secure client in the default timeout interval of one second.
Resolution	Use the parameter **SECURE_CLIENT_CONNECT_TIMEOUT** to adjust the timeout interval to connect to HP vPV server depending on your Internet connectivity or infrastructure setup.

Deployment of HP vPV fails

Symptom	The deployment of the HP vPV Virtual Appliance fails.
Cause	This may happen when the time on the ESX server is set to a future time.
Resolution	Ensure that the time on the ESX server is set correctly.

Unable to view content on HP vPV home page

Symptom	The HP vPV Home page does not display anything except the header.
Cause	JavaScript is not supported or Adobe® Flash Player is not installed in your browser. Adobe® Flash Player version 10.3 is the minimum required version.
Resolution	Install Adobe® Flash Player and enable JavaScript support for the Internet Explorer (IE) or Mozilla Firefox browser by adding HP vPV to your list of Trusted Sites. ● To add HP vPV Web server URL to a trusted site, perform the following steps: For IE browser a. From the Tools menu, click **Internet Options**. The Internet Options pop-up window appears. b. Click **Security** tab. c. Select the **Trusted Sites** icon. d. Click **Sites**. The Trusted Sites pop-up window appears. e. Type the HP vPV web server URL and click **Add**. The typed URL appears in the list of trusted sites. f. Click **Close**. g. Click **OK**. h. Restart the browser. For Mozilla Firefox browser a. From the **Edit** menu, click **Preferences**. The Options pop-up window appears. b. Click **Privacy** tab. c. Click **Exceptions**. d. Type the HP vPV web server URL in the box under Address of web site. e. Click **Allow**. f. Click **Close**. g. Click **OK**. h. Restart the browser.

Resolution	• If Adobe® Flash Player is not installed in your browser, HP vPV Home page does not appear. The browser displays a message stating that you must Install Adobe Flash Player to view the HP vPV Home Page. Click the message to download Adobe® Flash Player. • If JavaScript is not enabled in your browser, HP vPV Home page does not appear in the IE browser even after adding it as a trusted site. The browser displays a message stating that JavaScript is not enabled in your browser and you must enable JavaScript to view the page. To enable JavaScript support, perform the following steps: For IE browser a. From the Tools menu, click **Internet Options**. The Internet Options pop-up window appears. b. Click the **Security** tab. Check if the security level in your browser settings is set to High. c. Make sure the **Trusted Sites** icon is selected and click **Custom Level**. The Security Settings pop-up window appears. d. Scroll down to Scripting section and select the **Enabled** option under **Active Scripting**. e. Click **OK**. f. Click **Apply**. For Mozilla Firefox browser: a. From the Tools menu, click **Options**. b. Click **Content**. c. Select the **Enable JavaScript** check box. d. Click **OK**.

HTTP Status 404 - /PV Error

Symptom	When trying to access HP vPV, you get the HTTP Status 404 - /PV Error message.
Cause	The message appears if the *<INSTALLDIR>/www/webapps/PV* directory is empty.
Resolution	Extract the Perf.war file again from *<Install_Dir>/newconfig/PV* to *<Install_dir>/www/webapps/PV*. Run the command *pv deploywar*.

What are the log files available with HP vPV?

The following table lists the log files available with HP vPV:

Component	Description	Location
`pvcd` (PV Collection Daemon)	`pvcd` daemon uses XPL tracing mechanism. A default pvcdXPL.itc (trace configuration) is available in `/opt/OV/support` directory. To start the tracing, run `/opt/OV/support/ovtrccfg -app pvcd -cf /opt/OV/newconfig/conf/xpl/trc/pvcdXPL.itc` The XPL trace files are present at /tmp/pvcd_*.trc. To stop tracing, run `/opt/OV/support/ovtrccfg -app pvcd -off`	If tracing is enabled, `/tmp/ directory` contains the trace files (use - `ls /tmp/pvcd_*.trc`)
	`pvcd` and `pvconfig` tools log important status and error messages, if any, in `System.txt`.	`/var/opt/OV/log/System.txt`
Collectors	vCenter and OpenStack collector status log file `/var/opt/OV/log/status.virtserver`	`/var/opt/OV/log/status.virtserver`
	KVM collector status log file	`/var/opt/OV/log/status.kvm`
	XEN collector status log file	`/var/opt/OV/log/tmp/status.xen`
Database Transaction	Vertica catalog file to view database transactions	`/var/opt/OV/databases/pv/catalog/pv/v_pv_node0001_catalog/vertica.log`
User Interface	Local trace and log messages are logged in `pvtrace.0.txt`and `ovpm.0.log`	`/var/opt/OV/log`

Appendix: RPMs Packaged with the HP vPV Virtual Appliance

The RPMs packaged with the HP vPV Virtual Appliance are as follows:

- setup-2.8.14-20.el6.noarch

- basesystem-10.0-4.el6.noarch

- tzdata-2012j-1.el6.noarch

- glibc-common-2.12-1.107.el6.x86_64

- ncurses-libs-5.7-3.20090208.el6.x86_64

- libattr-2.4.44-7.el6.x86_64

- zlib-1.2.3-29.el6.x86_64

- audit-libs-2.2-2.el6.x86_64

- popt-1.13-7.el6.x86_64

- db4-4.7.25-17.el6.x86_64

- nspr-4.9.2-1.el6.x86_64

- bzip2-libs-1.0.5-7.el6_0.x86_64

- libselinux-2.0.94-5.3.el6.x86_64

- sed-4.2.1-10.el6.x86_64

- glib2-2.22.5-7.el6.x86_64

- gawk-3.1.7-10.el6.x86_64

- sqlite-3.6.20-1.el6.x86_64

- libxml2-2.7.6-8.el6_3.4.x86_64

- libstdc4.4.7-3.el6.x86_64

- dbus-libs-1.2.24-7.el6_3.x86_64

- grep-2.6.3-3.el6.x86_64

- findutils-4.4.2-6.el6.x86_64

- cyrus-sasl-lib-2.1.23-13.el6_3.1.x86_64

- libblkid-2.17.2-12.9.el6.x86_64

- keyutils-libs-1.4-4.el6.x86_64

- libgssglue-0.1-11.el6.x86_64

- libgpg-error-1.7-4.el6.x86_64

- vim-minimal-7.2.411-1.8.el6.x86_64

- checkpolicy-2.0.22-1.el6.x86_64

- sysvinit-tools-2.87-4.dsf.el6.x86_64

- perl-Pod-Escapes-1.04-129.el6.x86_64

- perl-Module-Pluggable-3.90-129.el6.x86_64

- perl-libs-5.10.1-129.el6.x86_64

- pth-2.0.7-9.3.el6.x86_64

- keyutils-1.4-4.el6.x86_64

- grubby-7.0.15-3.el6.x86_64

- upstart-0.6.5-12.el6.x86_64

- libusb-0.1.12-23.el6.x86_64

- nss-softokn-3.12.9-11.el6.x86_64

- xz-lzma-compat-4.999.9-0.3.beta.20091007git.el6.x86_64

- MAKEDEV-3.24-6.el6.x86_64

- net-tools-1.60-110.el6_2.x86_64

- tar-1.23-11.el6.x86_64

- pinentry-0.7.6-6.el6.x86_64

- e2fsprogs-libs-1.41.12-14.el6.x86_64

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- dash-0.5.5.1-4.el6.x86_64

- groff-1.18.1.4-21.el6.x86_64

- coreutils-libs-8.4-19.el6.x86_64

- cracklib-2.8.16-4.el6.x86_64

- coreutils-8.4-19.el6.x86_64

- module-init-tools-3.9-21.el6.x86_64

- redhat-logos-60.0.14-12.el6.centos.noarch

- libpciaccess-0.13.1-2.el6.x86_64

- rpcbind-0.2.0-11.el6.x86_64

- nss-3.14.0.0-12.el6.x86_64

- nss-tools-3.14.0.0-12.el6.x86_64

- libuser-0.56.13-5.el6.x86_64

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- mingetty-1.08-5.el6.x86_64

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- libffi-3.0.5-3.2.el6.x86_64

- newt-0.52.11-3.el6.x86_64

- ca-certificates-2010.63-3.el6_1.5.noarch

- python-libs-2.6.6-36.el6.x86_64

- libssh2-1.4.2-1.el6.x86_64

- curl-7.19.7-35.el6.x86_64

- rpm-4.8.0-32.el6.x86_64

- python-pycurl-7.19.0-8.el6.x86_64

- gnupg2-2.0.14-4.el6.x86_64

- pygpgme-0.1-18.20090824bzr68.el6.x86_64

- yum-metadata-parser-1.1.2-16.el6.x86_64

- yum-plugin-fastestmirror-1.1.30-14.el6.noarch

- bind-libs-9.8.2-0.17.rc1.el6.x86_64

- fipscheck-lib-1.2.0-7.el6.x86_64

- kbd-misc-1.15-11.el6.noarch

- policycoreutils-2.0.83-19.30.el6.x86_64

- iproute-2.6.32-23.el6.x86_64

- util-linux-ng-2.17.2-12.9.el6.x86_64

- udev-147-2.46.el6.x86_64

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- dracut-004-303.el6.noarch

- rsyslog-5.8.10-6.el6.x86_64

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- cronie-anacron-1.4.4-7.el6.x86_64

- crontabs-1.10-33.el6.noarch

- nfs-utils-1.2.3-36.el6.x86_64

- selinux-policy-3.7.19-195.el6.noarch

- kernel-firmware-2.6.32-358.el6.noarch

- dhclient-4.1.1-34.P1.el6.centos.x86_64

- system-config-firewall-base-1.2.27-5.el6.noarch

- bfa-firmware-3.0.3.1-1.el6.noarch

- iwl100-firmware-39.31.5.1-1.el6.noarch

- b43-openfwwf-5.2-4.el6.noarch

- aic94xx-firmware-30-2.el6.noarch

- iwl1000-firmware-39.31.5.1-1.el6.noarch

- authconfig-6.1.12-13.el6.x86_64

- gettext-0.17-16.el6.x86_64

- grub-0.97-81.el6.x86_64

- wget-1.12-1.8.el6.x86_64

- passwd-0.77-4.el6_2.2.x86_64

- audit-2.2-2.el6.x86_64

- acl-2.2.49-6.el6.x86_64

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- ql2100-firmware-1.19.38-3.1.el6.noarch

- libertas-usb8388-firmware-5.110.22.p23-3.1.el6.noarch

- ql2500-firmware-5.08.00-1.el6.noarch

- zd1211-firmware-1.4-4.el6.noarch

- rt61pci-firmware-1.2-7.el6.noarch

- ql2200-firmware-2.02.08-3.1.el6.noarch

- ipw2100-firmware-1.3-11.el6.noarch

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- vmware-studio-vami-service-oaconfig-1.0.0.0-0.x86_64

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- vmware-studio-vami-login-2.6.0.0-631426.x86_64

- libgcc-4.4.7-3.el6.x86_64

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- shadow-utils-4.1.4.2-13.el6.x86_64

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- openldap-2.4.23-31.el6.x86_64

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- python-iniparse-0.3.1-2.1.el6.noarch

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- openssh-5.3p1-84.1.el6.x86_64

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- iwl6000g2a-firmware-17.168.5.3-1.el6.noarch

- iwl6000-firmware-9.221.4.1-1.el6.noarch

- bind-utils-9.8.2-0.17.rc1.el6.x86_64

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- ivtv-firmware-20080701-20.2.noarch

- xorg-x11-drv-ati-firmware-6.99.99-1.el6.noarch

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- iwl4965-firmware-228.61.2.24-2.1.el6.noarch

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