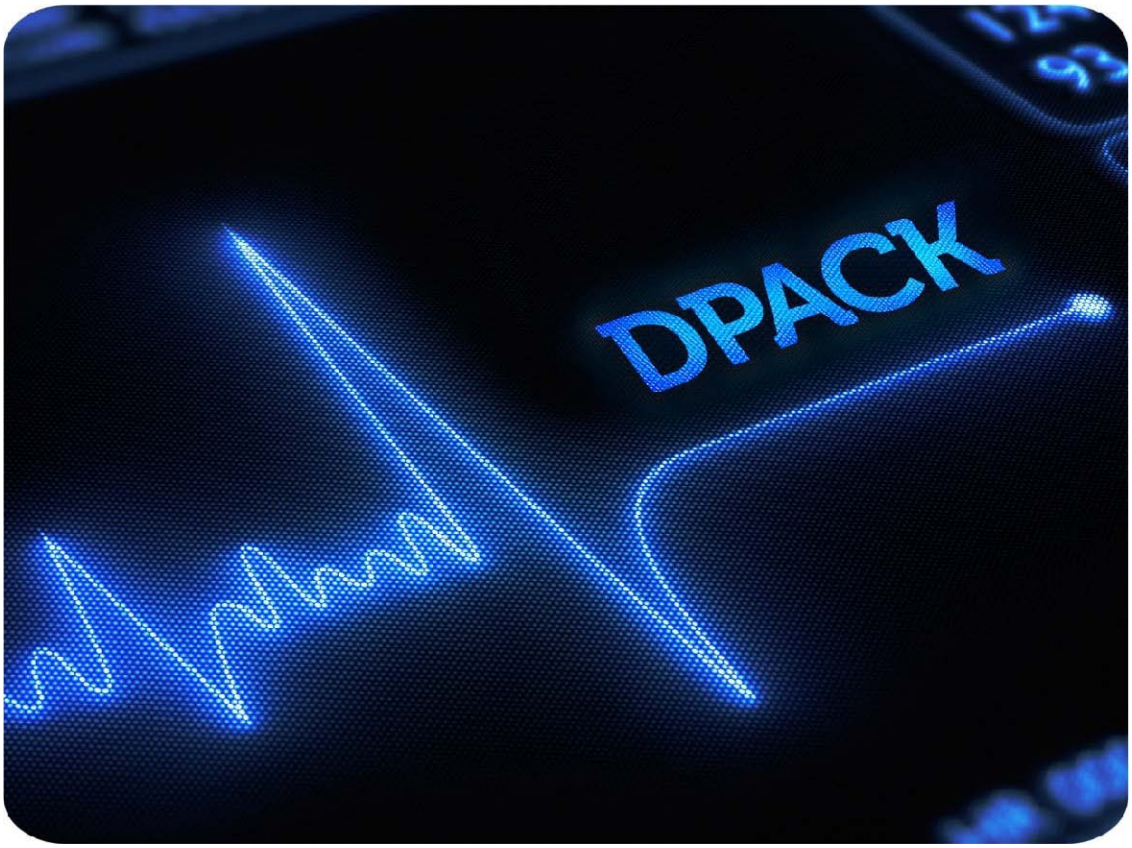
Dell Performance Analysis Collection Kit (DPACK)

User's Guide



Version: 1.5.0

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October 2012

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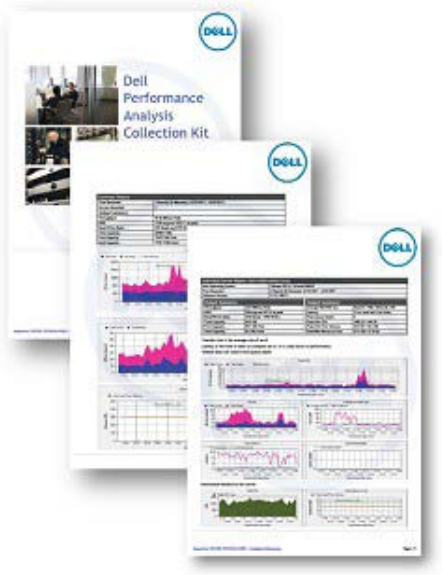
Overview

When approaching any storage or virtualization initiative, Dell implements a best practice of collecting performance information on the environment. The collected data is analyzed in order to provide an understanding of the current environment, which allows Dell to properly design and plan a scalable virtualization and storage solution. This is part of the value of doing business with Dell and is complementary to you as our customer.



Dell's Performance Analysis Collection Kit or DPACK is a lightweight, remote, and agent-less collection tool that supports the monitoring of many servers into a single file. The tool is traditionally run for a period of 24 hours and will produce a file with an extension of .iokit. These files are small enough to return to your Dell Systems Consultant or your Dell Reseller by email.

Once processed, we will provide an in-depth view of your server performance and capacity requirements that are useful in making future IT decisions as it relates to your business's key needs.

Several protocols are used during the collection processes and the upmost attention to the security of your company has been considered. Each Protocol is explained under the respective Operating System tutorial.

You can run more than one instance of DPACK, i.e. one Linux and one Windows, and the resulting files can be combined into a single report. Up to 10 .iokit files can be combined if run during overlapping time periods.

The resulting file is a PDF that is broke into 3 categories:

Aggregation Report
The aggregation report is a simulation of the recorded host's performance demands if moved to a shared resource environment like fully virtualized storage arrays such as Compellent or EqualLogic.

Individual Report
The individual report is a detailed summary of a single machine.

Summary Report
The summary report is an outline of all participating servers and their summed total contributions to values such as total capacity.

Supported Languages

DPACK supports several different languages. Support for languages is different between the collector and the PDF report. The report may be generated in any of the supported languages regardless of how the data was collected.

Language	Collectors	PDF Report
English	✓	✓
French	✓	✓
Italian	✓	✓
German	✓	✓
Portuguese (Brazilian)	✓	✓
Spanish	✓	✓
Japanese	✓	✓
Simplified Chinese	✓	✓
Korean	✓	✓
Russian	will run in English	✓
Polish	will run in English	✓

When run the collectors look to the Operating System for the current language setting, and if supported the collectors will operate in the language. If the language setting is not supported, the collectors will default to English.

Information Collected

On all Operating Systems DPACK will write the collected data to a proprietary file with an extension of .IOKIT

All collector versions record the same data outlined here:

- User contact information (optional)
- Machine Names (can be manually overridden by the user to mask real name)
- Machine Operating System (Publisher, Version, and Patch level)
- Local time when collection started and when collection ended
- Collector Type and Version
- Protocol Used to collect data
- Physical Disk drive name or number
- Logical Drive names (letters) mounted on Physical disks
- Capacity of Physical Disks
- Capacity Used on Physical Disks
- Capacity Free on Physical Disks
- Physical Disk Block Size
- Total Memory
- Total Memory Used
- Total Memory Free
- Machine CPU Description
- Machine CPU Usage rates
- Read IOPS**
- Write IOPS**
- Read KB/sec**
- Write KB/sec**
- Avg. Read Size**
- Avg. Write Size**
- Read Latency**
- Write Latency**
- Queue Depth**
- Count of collector connection errors
- Count of collector scrubbed counters
- VMware Virtual Memory Settings

** Tracked per Physical Disk

Passwords are never stored in the *.iokit files.

For both local and remote Windows collection, DPACK gathers a list of installed applications.

This information includes each application name and version.

In the case of Windows, the list of applications is the same list that is visible in the Add/Remove Programs view, while for Unix and Linux the list is that outputted by the various package management applications.

Users may optionally opt out of including the installed list in the resulting *.iokit file(s). In this case, the collector will still gather the application information, but it will not be included in the output files.

Supported and Unsupported Operating Systems and Platforms

Platform / OS	Run Collector Locally	Can be Collected Remotely from Other	Can Remotely Connect from this OS
Windows 2000 SP 4 **Windows XP SP 3**	Yes	Yes	No
Windows Server 2003 **Windows Vista** **Windows Server 2008** **Windows 7**	Yes	Yes	Yes, can remotely connect to other Windows servers or to a VMware vCenter server
VMware vCenter 3.5+ with ESX servers 3.5+	No	Yes, you gather VMware data by remotely collecting from a supported Windows OS, which could also be the vCenter server itself.	No
Red Hat EL 4.8* **Red Hat EL 5, 6** **SuSE 10, 11, 12** **Ubuntu 11, 12** **Gentoo 12** **CentOS 5, 6**	Yes	Yes	Yes, can remotely connect to other Linux, Solaris, and HP-UX servers.
Solaris 10 **Solaris 11** **HP-UX 11.3+**	No	Yes as a part of our BETA testing program, you may gather Solaris and HP-UX data by remotely connecting from a supported Linux OS.	No
Mac OS-X **AIX** **BSD**	None of these operating systems are supported at this time.		
Citrix Xen Server	Directly connecting to Xen server is not supported at this time. See the section on Xen Server for a suggested workaround.		

* EMC Powerpath is currently not supported on RHEL 4. Due to a bug, all multipaths on RHEL 4 will be reported as individual disks. This will overstate both the capacity and IOPS. We are working to fix this issue.

DPACK Disk Identification

DPACK will identify physical disks or LUNS on these supported operating systems that are either directly attached or SAN attached.

DPACK does not support and will not detect NAS storage*. NFS mounts and CIFS file shares will not be detected by DPACK.

While DPACK will identify and monitor SAN disks mounted by supported operating systems, DPACK cannot directly connect to storage array appliances.

In the case of multi-pathed SAN LUNs, DPACK will report the LUN as a single entity, and report the aggregate IO across all paths.

In the case of VMware when DPACK is connected directly to a vCenter server, DPACK will not identify mounted CIFS or NFS shares on the guest VMs, nor will it identify iSCSI SAN LUNs mounted directly by the guest VMs using software initiators. DPACK will identify pass through disks such as RDMs and raw LUNS connected to the ESX servers.

This is also true with Hyper-V virtual machines. DPACK will not identify iSCSI LUNs that are mounted directly by the virtual machines using a software initiator.

* DPACK will detect NAS mounted VMware Datastores if the ESX server and vCenter server are running version 4.1 or greater.

Downloading the Collector

The current version of DPACK is located at support.dell.com, the latest version of the collector is updated only in this location. You can search for the keyword "DPACK" or use the search link below.

You can begin the process by downloading the OS specific collectors you need for your environment at this link:

http://www.dell.com/downloadDPACK

Direct links to the collectors expire with every release. Therefore, do not share direct links to the collector downloads.

Do not distribute collectors on USB drives or third party FTP sites.

We advise wherever possible that end-users download collectors directly from the Dell website.

The checksum of the download Linux collector dpack.tar.gz file should always be compared with the posted checksum to guarantee authenticity and integrity of the downloaded file. SHA1 and MD5 checksums are both posted on the download page.

The Windows DellPack.exe collector should always have a genuine Dell digital signature. Check the signature before opening:

- Right click on DellPack.exe
- Select **Properties**
- Click on the **Signatures** tab
- You should see a Dell Inc. digital signature. If you do not see this, do not proceed further and contact DPACK_Support@Dell.com for immediate assistance.

Mixed OS Environments

The Windows DPACK collector can connect with Windows and vCenter servers, but not Linux or Unix servers. Likewise, the Linux DPACK collector can only connect with Linux and Unix servers.

If you have a mixed OS environment, download both collectors and have each collector gather data for its supported platforms. After collection, you may combined the resulting *.iokit files into a single report, as long as the collections are started within one hour of each other, and cover roughly the same period of time.

Windows DPACK Collection

Servers can be observed either by *local collection* or by *remote collection*.

Local collection is where the server is monitored by a DPACK (DellPack.exe) process that is running on the same machine.

Remove collection is where the server is monitored over the network by a DPACK process running on a different machine.

By default, DPACK will examine the local drives of the machine hosting the DPACK instance. However, you may optionally choose to exclude these drives from the collection process.

DPACK may run on a virtual machine, and there is no problem running DPACK on a virtual machine within a VMware environment that is being monitored.

Windows Collection Under the Hood

DPACK uses Microsoft's PDH protocol to gather performance information when collecting locally. If there is an error establishing the PDH protocol, DPACK will attempt to connect using Microsoft's WMI protocol.

Although rarely used, you may force the collector to only use the PDH protocol locally by running the DellPack executable with the /pdh command line switch. You may force the collector to only use the WMI protocol locally by running the DellPack executable with the /wmi command line switch.

When connecting to a remote Windows server, DPACK uses Microsoft's WMI protocol to gather information. When remotely connecting using WMI, it is advised to periodically monitor the CPU and memory usage on the machines being monitored. In an extremely small number of cases, it has been reported that certain software and OS configurations might result in unwanted CPU and memory overhead on the remote machine being collected.

Never remotely add a Windows Server 2008 or Windows 7 machine from a DPACK instance running on the older Windows 2003 operating system. Such a configuration can result in a memory leak in the WMI service. See this Microsoft KB article for more information:

http://support.microsoft.com/?id=970520

As a general rule, try and run DPACK on the most recent OS with the most current service pack and updates.

Running DPACK for Windows and/or VMware vCenter Servers

The Windows DPACK collector supports connecting to both Windows servers and the VMware vCenter server.

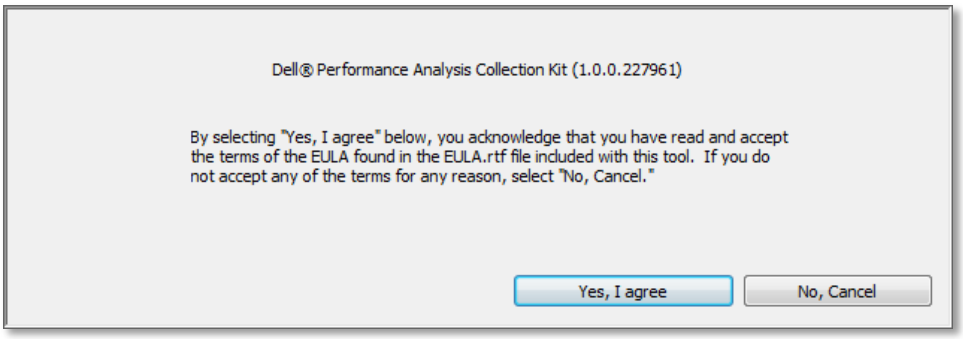
Download the collector ZIP file, extract the contents, and verify the digital signature of the DellPack.exe file as described in **Downloading the Collector**.

Make sure that the DellPack.exe executable is copied to a normal folder, and is not executed from a mounted network share, USB drive, or from the ZIP folder. Running from any of those folder types may cause problems during the collection.

You may launch the DellPack.exe executable by either double clicking the file or running it from the command line.

Note: *DPACK does not install. It runs in memory within your user's login session. Logging off the machine will terminate the collection and the data collected up to that point will not be recoverable. We recommend that you lock the machine during the collection process if you leave the console. If using Remote Desktop (RDP) to connect to the server running DPACK, make sure that the RDP session will not time out and log off your user session.*

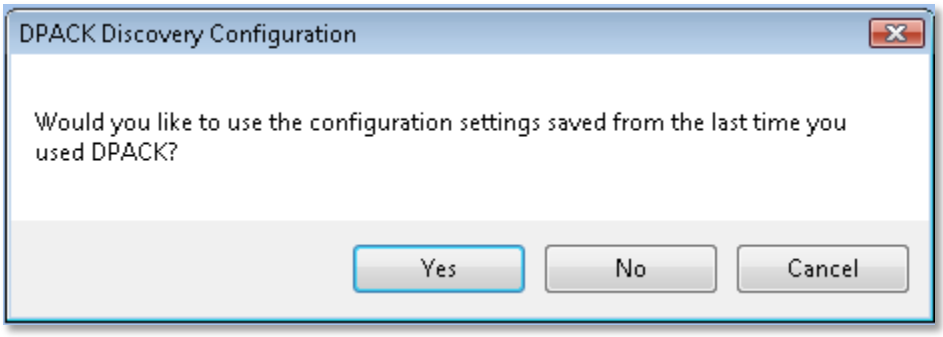
To use DPACK, you must accept the terms and conditions of the End User License Agreement which is included in the ZIP download.



Loading a Saved Configuration

If you are running DPACK for a second time or you have restarted your collection. DPACK now remembers your server configuration from your last collection by storing this information in a file named DPACK_Configuration.xml in the folder where you ran DPACK.

When restoring from a previous configuration, you will be prompted for all passwords, as DPACK will never write a password into a file. However, it will remember the addresses of all of the remote servers added, and remember any disks that you previously removed from the collection list.



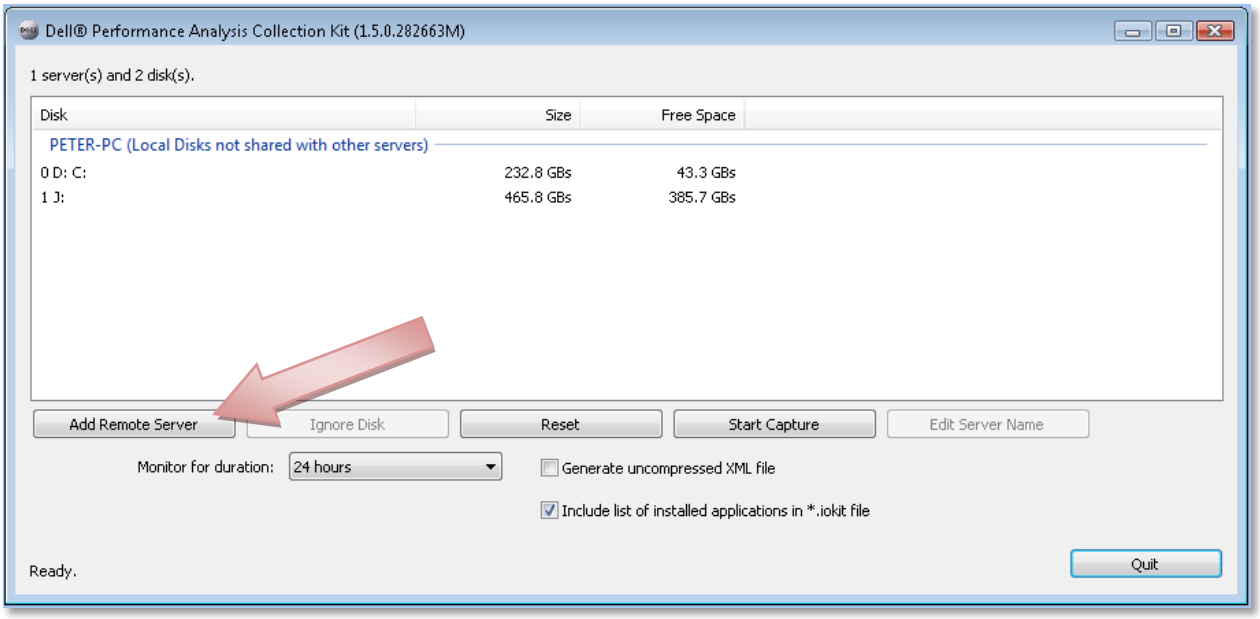
DPACK generates a DPACK_Configuration.xml file automatically as you interact with DPACK during the "discovery" or setup phase. This file will appear in the folder from where you run DPACK. If you run DPACK again, DPACK looks for the presence of this file and if it detects this file, DPACK asks the user if they wish to restore their previous setting. This is a time saver.

Tip: *DPACK will overwrite an existing DPACK_Configuration.xml file. We recommend that if you are working with a large number of servers and manually editing the DPACK_Configuration.xml file, that you make a backup copy of the configuration file, just in case.*

Adding Remote Servers for Monitoring

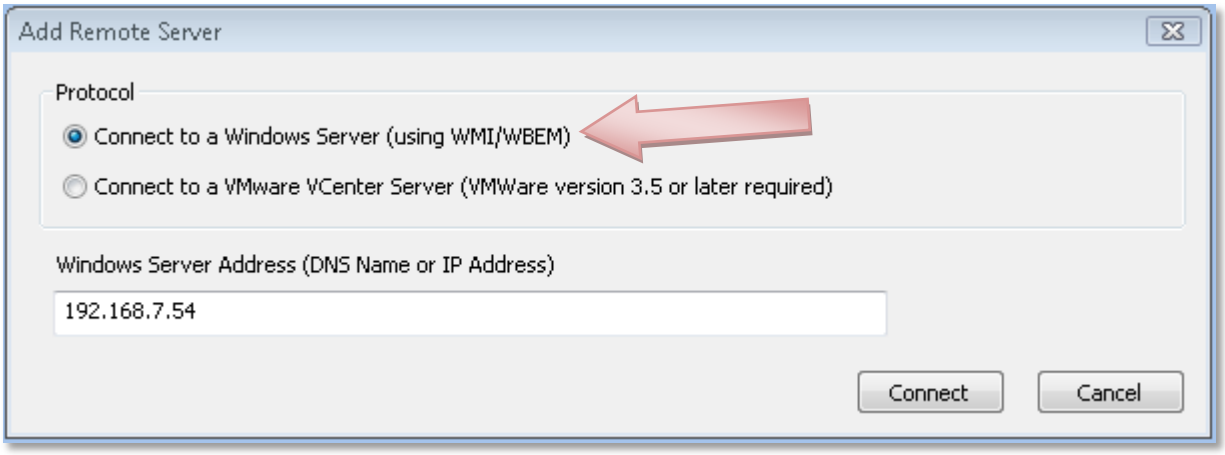
By default DPACK will identify and monitor all disks on the machine where DPACK is running.

To add a remote server, click the **Add Remote Server** button.



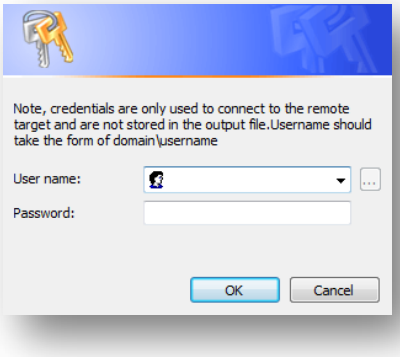
Tip: *To mask or change the name of a machine, click on one of the disks hosted by that server, and click the Edit Server Name button. This will change the name stored for that server in the resulting *.iokit file.*

Select the Windows Server WMI/WBEM protocol radio button, and then type in either the DNS name of the server, or the IP address.



Then click **Connect**.

Note: *DPACK does not currently support Active Directory scanning or IP address ranges.*



Windows will prompt you for a username and password. Passwords are stored in encrypted memory, but never on disk. By storing in encrypted memory, DPACK will remember your password the next time that you add a remote server. Assuming that the server uses the same account, you do not have to retype the password.

You can add physical or virtual machines using this method. The hardware running the OS has no impact on DPACK's ability to record.

Adding Hyper-V Servers and Windows Clustered Servers

For Windows Hyper-V, add each host in the Hyper-V cluster, and then run the collection session.

For a Hyper-V setup running in a Core configuration, you must run DPACK from a workstation or server other than the Hyper-V Core servers. DPACK cannot run directly on a Core server. You may optionally exclude the disks on the machine where DPACK runs if you do not wish them to be in the final report.

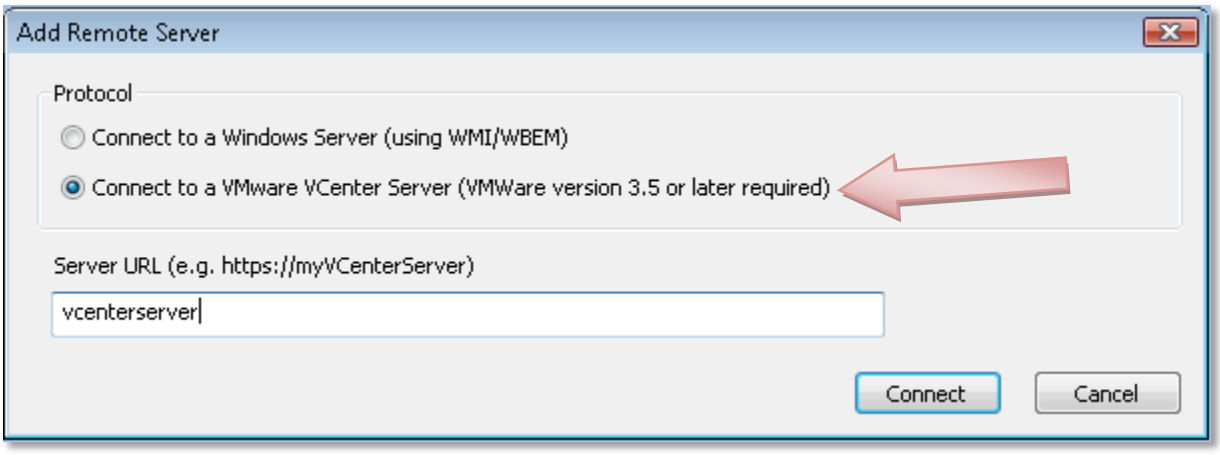
For Windows Cluster Servers, you must add each cluster node to the DPACK discovery list.

Adding a VMware vCenter Server

The Windows DPACK collector supports adding a VMware vCenter server running 3.5 or above. DPACK uses the same protocol to gather information as VMware vSphere Client. This protocol uses HTTPS/SOAP. Make sure that your firewall allows DPACK to access outbound HTTP ports.

DPACK can be run on the server where vCenter is installed, but you must still manually add the vCenter server.

In either case, click on the **Add Remote Server** button in the DPACK discovery window. Be sure to select the VMware protocol in the **Add Remote Server** dialog.



Then enter in the DNS name or IP address of the vCenter server, or the full URL to the vCenter service.

If vCenter was setup using non-default ports for the service URL, then the full URL with the port number must be specified.

Do not attempt to connect DPACK directly to an ESX host. Although this may appear to work, this operation is unsupported and the data gathered will be invalid. In the event that the setup is a free version of ESXi, we recommend that you gather data from the individual guest VMs instead.

When connecting to a vCenter server, this warning is always shown:

Final Adjustments Before Starting Collection

Once you have added all of the remote servers that you wish to monitor, you will need to make any final adjustments prior to starting the collection process.

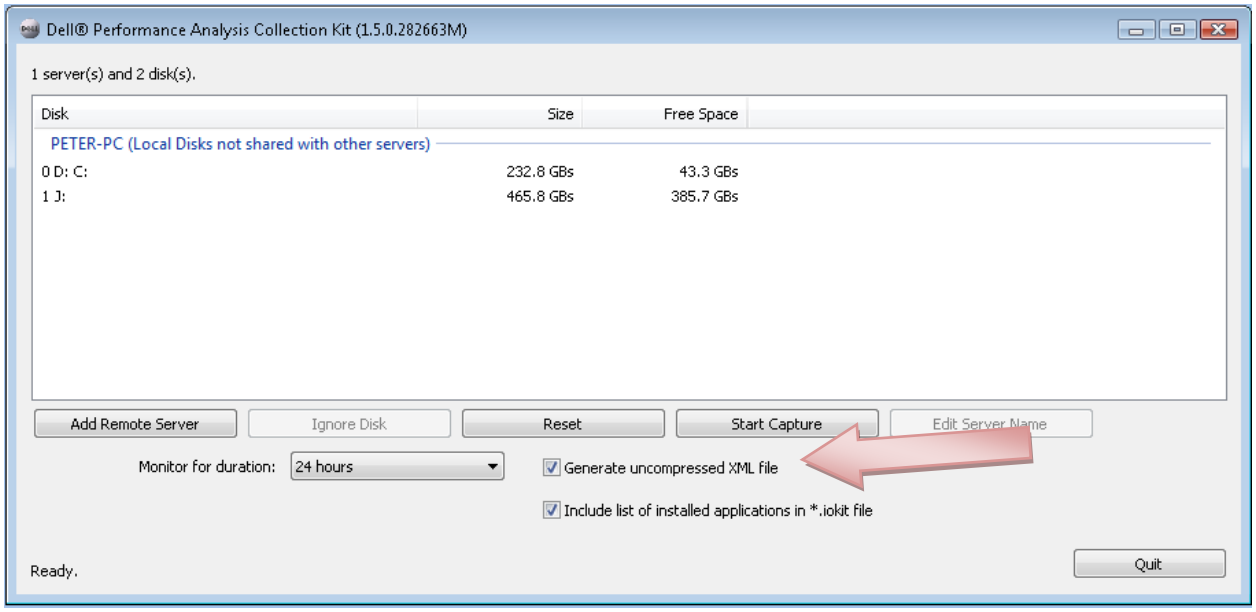
You may change or mask server names, drop any disks that you do not wish to be included in the collection, and select duration. By default you may select between 4-24 hours. A minimum of 4 hours must be recorded to produce a report.

For vCenter deployments exceeding 20 ESX servers, it is strongly advised that you limit the collection to 24 hours. Longer collections will result in large and unwieldy *.iokit files.

Note: *Although in most cases it's not necessary to record more than 24 hours, you can record for up to 7 days by using the /extended command line switch. Dell recommends leaving the default of 24 hours as extended recordings very rarely effect sizing exercises.*

Optional Security

Dell is very aware of your security and privacy concerns. If you are concerned about what data is written to the *.iokit file you can select the **Generate Uncompressed XML** option.

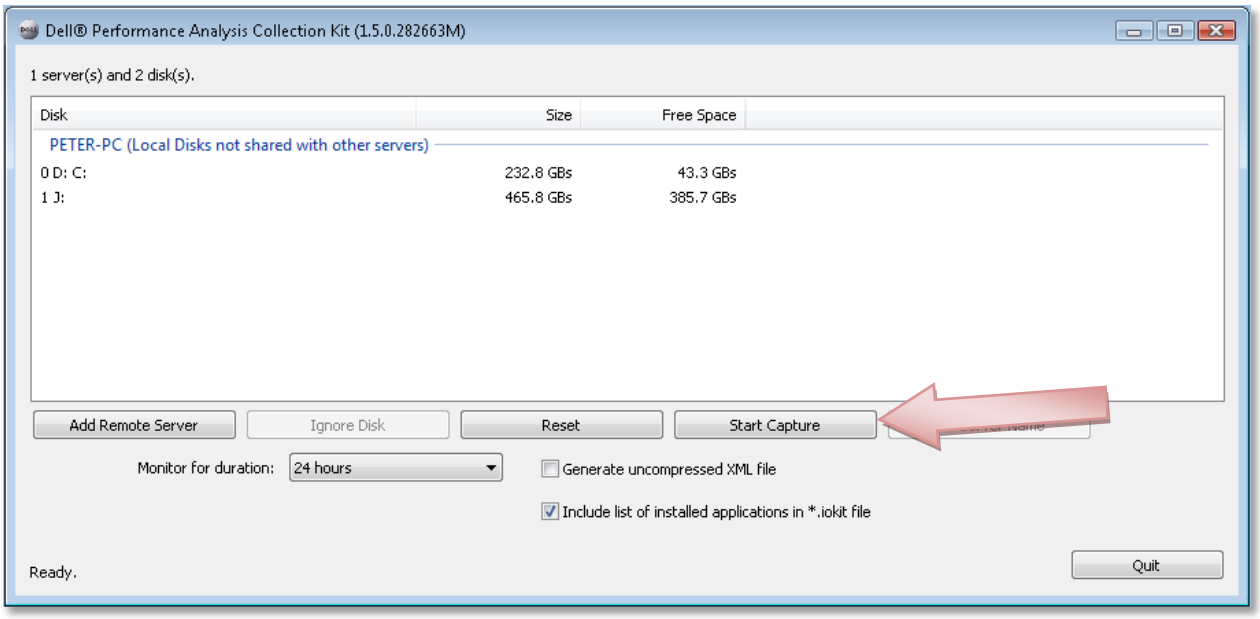


If selected, at the end of collection, the uncompressed raw XML data that is included in the iokit file is also written to a separate file for your review. The XML file can be read in any text or XML editor.

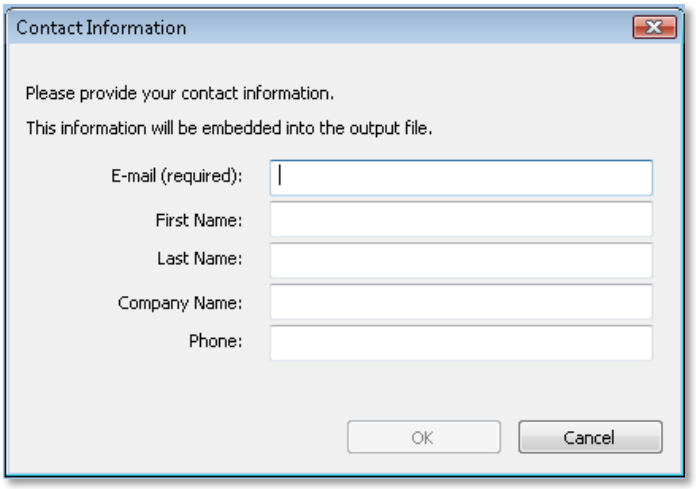
This XML file is for your review. Please do not forward it to Dell as all we require is the normal *.iokit file which is much smaller in size and easier to transport.

Starting Capture

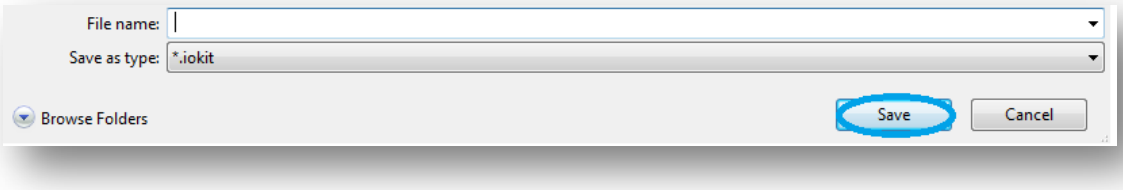
When you are ready to begin, click the **Start Capture** button.



You will be asked to provide some contact information so that we can associate the iokit file produced with the correct end user and return the report.



Next you will be prompted for the name and location to store the iokit file.

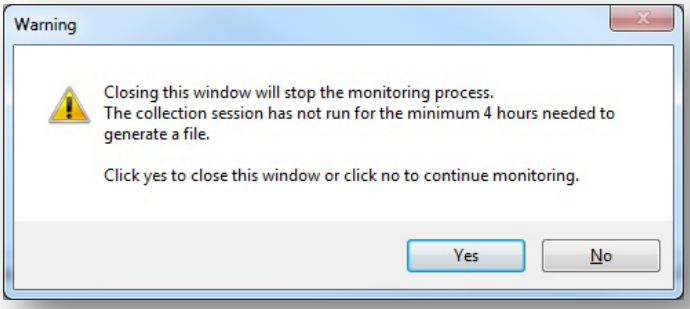


The iokit file will only be created at the end of the collection session.

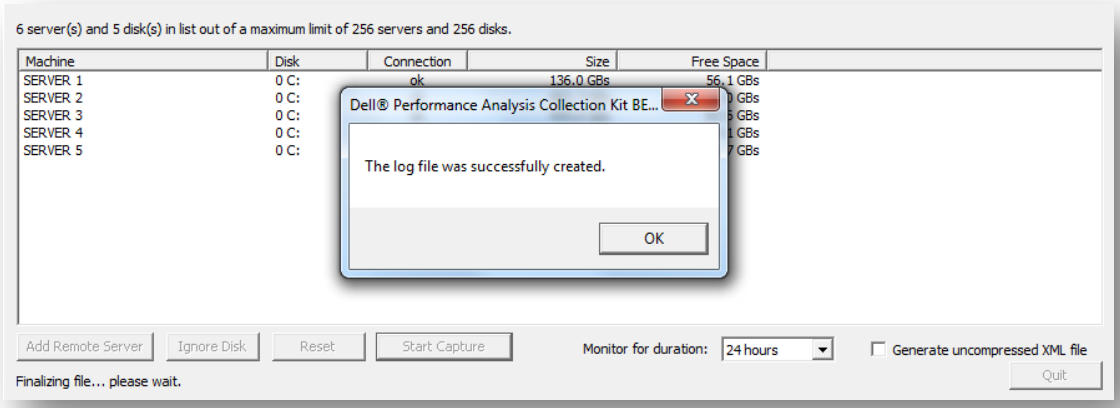
Ending the Collection Process

The collection will terminate automatically when the selected duration has been reached. If any collection process is terminated manually prior to that time then any data collected that is over 4 hours will be flushed to an iokit file. Collection periods less than 4 hours will not be saved.

If the collection is terminated manually you will be prompted with this message:



When collection is successful, you will see this message:



Linux DPACK Collection

DPACK on Linux conceptually is identical to Windows collection, except that instead of a Windows Desktop GUI application, on Linux DPACK operates off of the command line.

First, download the dpack.tar.gz file for the latest version of collector as discussed here: **Downloading the Collector**.

Next, confirm that the checksum matches the checksum posted on the download page with the sha1sum command:

```
> sha1sum dpack.tar.gz
```

The output checksum of the sha1sum command should match the output string posted on the download page. Alternatively, you may use the md5sum command instead of sha1sum.

Next, make a temporary directory:

```
> mkdir dp
```

Copy the tar.gz file into the temporary directory:

```
> cp dpack.tar.gz dp/dpack.tar.gz
```

Now, change directory into the temp folder:

```
> cd dp
```

Now unpack the tar gz file:

```
> tar –xzf dpack.tar.gz
```

Run the DPACK binary

```
> ./dellpack
```

Follow the command line interface. First must accept the End User License Agreement that is included in the files unpacked from the tar.gz file.

```
[phunter@RHEL6 dp]$ ./dellpack

Dell Performance Analysis Collection Kit (version 1.5.0.285098M)
running.
Outputting debug trace to DPACK_TroubleshootingTrace.txt
By typing "yes" below, you acknowledge that you have read and accept
the terms of the EULA found in the EULA.rtf file included with this
tool.  If you do not accept any of the terms, please type "no."
(yes/no): yes
```

You will be asked to provide some contact information so that we can associate the iokit file produced with the correct end user and return the report.

```
Provide your contact information.
This will be embedded into the resulting data file.
Enter contact e-mail (required): DPACK_Support@Dell.com
Enter contact's first name (return, to skip entering any more contact
info): Peter
Enter contact last name: Hunter
Enter contact company name: Dell
Enter contact phone: 1 (404)-555-1212
```

Next, DPACK will automatically examine the local disks on this machine. For each disk discovered, DPACK will ask if you wish to include them in the monitoring list. If you are planning on remotely monitoring from this machine, but do not wish to include it in the final report, then answer no to each local disk prompt.

```
Identified 1 physical disks on server 'RHEL6.dev.dell.com'.

Machine.................................Disk.........................

RHEL6.dev.dell.com                      sda

Press any key to continue.


Physical disk identified: sda
Size: 149.05 GB
Used: 0.05 GB
Free: 149.00 GB
Would you like to monitor this disk during the session (yes/no)? yes
```

Once, DPACK has finished discovering the local disks, you be presented with the main menu.

```
1 server(s) and 1 disk(s).

Please select one of the following options by pressing the key in
parentheses:
 (1)  Begin monitoring
 (2)  Change the output filename. (currently RHEL6.iokit)
 (3)  Change the session duration. (currently 24 hours)
 (4)  Show a table of the current machines and disks to be monitored.
 (5)  Add a remote machine to be monitored using a remote shell.
 (6)  Change the name of a machine to hide its identity.
 (7)  Toggle setting for creating non-compressed xml copy of output
(currently false).
 (8)  Remove a disk from the list of disks to be monitored.
 (9)  Quit.
```

Adding Remote Servers to Linux DPACK Collection

To add a remote server, select option 5 from the main menu by pressing the 5 key.

```
Please select one of the following options by pressing the key in
parentheses:
 (1)  Begin monitoring
 (2)  Change the output filename. (currently RHEL6.iokit)
 (3)  Change the session duration. (currently 24 hours)
 (4)  Show a table of the current machines and disks to be monitored.
 (5)  Add a remote machine to be monitored using a remote shell.
 (6)  Change the name of a machine to hide its identity.
 (7)  Toggle setting for creating non-compressed xml copy of output
(currently false).
 (8)  Remove a disk from the list of disks to be monitored.
 (9)  Quit.

5

At this time the Dell Performance Analysis Collection Kit can only
gather data from machines running the Linux OS.
The collector works by letting you establish a SSH connection with the
machine to monitor.

/usr/bin/ssh will be used.

Enter the SSH command line you would use to connect to the remote
machine:

   example:  ssh server.mydomain.com
             ssh myuser@server.mydomain.com

ssh root@127.0.0.1
```

DPACK uses SSH to remotely connect to the remote server. You must have SSH enabled on the remote server in order for DPACK to work.

Type in the ssh command line as you would normally.

Tip: *In the example above, the login user is root. You do not necessarily have to run as root on the target server. DPACK only requires read access to some system files. Every Linux setup is different, but a good rule of thumb is that if you can run commands like **iostat** and **df**, then you have the right permissions to run DPACK.*

Depending on whether or not you are using RSA keys for password-less authentication or not, you may be prompted to enter in a password for the remote server.

Once you have logged into the remote server, DPACK takes over the SSH session and moves it into the background.

DPACK then begins the process of discovering the disks on the remote server, and just like with the local disks, DPACK will ask if you wish to include each disk as it is discovered.

You may add any remote server that is running any of the supported Linux distributions, or any of the BETA supported Solaris or HP-UX operating systems.

Starting Collection on DPACK Linux

Once you have added all of the remote servers, choose option 1 from the main menu to begin monitoring.

By default, DPACK on Linux runs in the foreground as a typical shell application. If you terminate the shell terminal where DPACK is running, you terminate DPACK, and any data collected will not be recoverable.

We recommend that you run DPACK in foreground. However, if you prefer to run DPACK in the background as a daemon, that option is available.

In the daemon mode, DPACK will run in the background. You may terminate the terminal shell without affecting the DPACK process. However, you will not be able to see the output of DPACK (standard out) unless you tail the .DPACK_STDOUT file.

Again, we recommend that you normally run in the foreground and thus answer 'no' to the prompt:

```
Run DPACK in the context of this shell so you can monitor output
during collection.

To avoid the shell closing before the process completes, you can also
run DPACK as a background process (daemon).

Would you like DPACK to run as a background process detached from this
shell?  (yes/no) no
```

After this point, DPACK will not require any more interaction. The collection will complete 24 hours later, and DPACK will automatically generate the iokit file, which by default will be named after the host machine running DPACK in the DPACK folder.

If you wish to prematurely terminate the DPACK process, you may press CTRL-C during the collection. This will cause DPACK to flush out whatever data it has captured as long as at least 4 hours of data has been captured. Otherwise, no iokit file will be created.

Oracle ASM Volumes on Linux

If the ASM volume is being mirrored by the logical volume manager to underlying paths, DPACK will report the net IO to the underlying paths.

e.g. if you have a volume made up to two disks and a log in a lvm mirror, the writes reported by DPACK will be roughly double the writes that were issued to the volume as each write operation was mirrored to the underlying paths as well as writes to the lvm mirror log disk. This only applies to systems with Oracle ASMLIB installed.

For systems without Oracle ASMLIB, DPACK will report the IO issued to the logical volume, and will not report the duplicative write IO that is used when lvm mirroring is employed.

You may not wish to remove the mirror drive at the time of collection. If needed it can be removed at the time of report creation, but if the writes will be mirrored on your new storage array then they would still need to be considered.

Remote Collecting from Solaris Servers

We are currently BETA testing support for some Solaris operating system versions.

Because this is a BETA program, please expect occasional problems. If you run into any issues, please report them immediately to DPACK_Support@Dell.com.

Support for Solaris extends to the Solaris 9, 10, and 11 OS versions.

DPACK supports Veritas DMP and Clusters version 6.0

DPACK supports Solaris multi-pathing.

Do not attempt to run the dellpack binary directly on a Solaris server.

DPACK only supports collecting from Solaris remotely, where DPACK resides on a supported Linux platform.

Follow the instructions for running DPACK on Linux found here: **Linux DPACK Collection**, and then add the Solaris server as you would add any server.

If you are running Vertias DMP and have volumes that consist of mirrored paths, DPACK will report the net IO activity of the underlying paths. Thus a write operation to a volume with two mirrored disks will result in two writes reported by DPACK. This only applies to Veritas DMP volumes.

If your Solaris server is configured with Zones, we recommend first trying to run DPACK on the root Zone. If the root Zone is configured to not have access to disks running on independent Zones, then you may encounter an error. In this case, we recommend that you try running DPACK on the independent zones. You can combine the resulting *.iokit files from each zone into a single PDF report, as long as they start collection within an hour of each other.

Remote Collecting from HP-UX Servers

We are currently BETA testing support for some HP-UX operating system versions.

Because this is a BETA program, please expect occasional problems. If you run into any issues, please report them immediately to DPACK_Support@Dell.com.

Support for HP-UX extends to the 11.3 or greater operating systems.

Do not attempt to run the dellpack binary directly on a HP-UX server.

DPACK only supports collecting from HP-UX remotely, where DPACK resides on a supported Linux platform.

Follow the instructions for running DPACK on Linux found here: **Linux DPACK Collection**, and then add the HP-UX server as you would add any server.

If you are running Veritas DMP on HP-UX, DPACK will report the underlying physical disks and their IO activity, but will incorrectly report those disks as being 100% used in terms of capacity. Any mirrored volumes will be reported based on their underlying disk activity. Thus a write operation to a volume with two mirrored disks will result in two writes reported by DPACK.

We are working on resolving the issues with Veritas DMP on HP-UX.

Collecting from Citrix Xen Servers

At this time collecting directly from Citrix Xen Servers is not supported. We are working on adding this support, but in the meantime…

Do not attempt to either run the Linux DPACK collector on a Citrix Xen Server or attempt to remotely add a Citrix Xen Server using the Linux DPACK collector.

The recommended workaround is to follow this procedure:

Run the Windows and/or Linux collector(s) on a workstation or server that is not a guest virtual machine inside the Xen virtual datacenter. Add the virtual machines using the normal **Add Remote Server** functionality. You may optionally exclude the disks from the local machine where DPACK is running.

If you have a mixed virtual OS environment, use both the Linux and the Windows collectors. You may combine the resulting iokit files into a single PDF report, as long as the collections start within an hour of each other.

If necessary, you may run the collectors directly on the virtual guest machines.

What's New

Here is a summary of the significant changes in the 1.5.0 version of the collectors:

- The collectors now require that you enter in a valid e-mail address for the contact information.
- BETA support for HP-UX.
- Users may opt out of including the installed application list in resulting iokit file with the Windows collector.
- Fixed an issue in the 1.4.0 Windows DPACK collector that caused DPACK to unexpectedly close when running locally on Windows Server 2008 with Hyper-V installed.
- Fixed an issue when running on Windows 2000 and Windows XP where DPACK closed unexpectedly when the user clicked on Add Remote Server.

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