Dell Precision Optimizer Administrator's Guide

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1. Introduction

This document describes tools available for IT administrators to manage Dell Precision Optimizer remotely. It also contains helpful tips and recommendations to make it easier for administrators to manage Dell Precision Optimizer.

2. Dell Precision Optimizer Components

The four main components of Dell Precision Optimizer are:

- Performance
- Track & Analyze Engine (TA)
- System Maintenance (SM)
- Dell Precision Optimizer Manager CLI (dpoCmd.exe)

Each of the above subsystems is implemented as a Windows service that also acts as a COM server. The Dell Precision Optimizer installer package installs the services along with Dell Precision Optimizer support DLL(s), user interface (UI) components, kernel mode device driver(s), etc. into the POA Installation folder. Additionally, a taskbar application may be installed and launched whenever the user logs on. This application would be responsible for notifying the user of various POA events such as update completion and reboot required.

The Dell Precision Optimizer installer package will also be responsible for creating a software registry key that will be used by Dell Precision Optimizer modules. For the purpose of this document we shall assume the following defaults:

Installation Folder:	***C:\Program Files\Dell\PPO***
Registry Path:	***HKLM\Software\Dell\PPO***
Runtime Data:	**C:\ProgramData\Dell\PPO**

The installation package may also copy some default Profiles and Policies to the installation folder.

2.1 Uninstalling Dell Precision Optimizer

Dell Precision Optimizer application can be uninstalled from the system using the steps below.

The uninstall command can be fetched from the registry by reading the value of the string "**UninstallString"** from the following location:

[For 64bit system]
HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Microsoft\Windows\CurrentVersion\Uninstall\{D66A3355-FEA4-4F60-8BAF-D6CBEDB396D8}

[For 32bit system]
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\{D66A3355-FEA4-4F60-8BAF-D6CBEDB396D8}

A sample value for “UninstallString” is shown below:

"C:\Program Files (x86)\InstallShield Installation Information\{D66A3355-FEA4-4F60-8BAF-D6CBEDB396D8}\setup.exe" -runfromtemp -l0x0007 -removeonly

Where -l0x0007 may be different for the system.

From a command prompt (run as administrator), typing the above command will launch the uninstall process of the Dell Precision Optimizer application. The above command can be modified to run the uninstall silently by adding the following :

-s –f1<full-path-of-iss>

E.g. If the silent response file (.iss file) is in in c:\temp folder and its name is “uninst.iss” then following command will run uninstall silently.

"C:\Program Files (x86)\InstallShield Installation Information\{D66A3355-FEA4-4F60-8BAF-D6CBEDB396D8}\setup.exe" -runfromtemp -l0x0007 –removeonly –s –f1c:\temp\uninst.iss

3. Performance

The Performance subsystem consists of the following modules:

- Policy Processing Engine (PPE)
- Profile Update Tool (profUpd.exe)
- Update Options Tool (upgradeOpt.exe)

3.1 Policy Processing Engine (PPE)

PPE is implemented as a Windows Service which starts execution as soon as the machine boots up regardless of whether the user is logged on.

PPE provides an interface which can be used to perform tasks such as the following:

- Activate or de-activate profiles

- Enumerate input and output parameters to allow new policies to be created.
- Save and retrieve profiles and policies for machines, users or third-party Dell Precision Optimizer-aware applications.

3.2 Profile Update Tool

This command line tool (profUpd.exe) will be used by Dell Precision Optimizer UI to check and update the profiles from the Dell server. A local configuration file should be used to inform Dell Precision Optimizer the Dell server address and which protocol to use (e.g. HTTP, HTTPS or FTP).

NOTE: All profiles and policies on the server are digitally signed and stored encrypted using AES-256 algorithm.

3.3 Profile Update Tool

This command line tool (upgradeOpt.exe) will be used by Dell Precision Optimizer UI to start the Dell support site URL in the default browser. The site will show lists the hardware upgrade options available for the specific system.

4. Track and Analyze (TA)

Analysis sub-system provides the ability to generate the following types of reports:

- System Analysis Reports
- Workload Analysis Reports
- CPU Intelligence Reports
- Graphics Intelligence Reports
- System Health Reports
- Smart Notifications

System Analysis Reports provide data collected by Dell Data Vault (DDV) application in an XML format.

The **Workload Analysis** feature allows the user to analyze their workload.

4.1 System Analysis Reports

The user can enable or disable these reports using the Dell Precision Optimizer COM interface. This interface also allows the user to configure how often System Analysis reports will be generated, to enumerate and read existing reports. The System Analysis Report XML contains the report data which is divided into <ddv_group> and <ddv_subgroup> elements. All data related to the same category will be under the same group. E.g. all thermistor 0 related data will be under DDV_GROUP called “Thermistor 0”.

4.1.1 Report Settings

Enable System Analysis

Type: ENABLE/DISABLE Checkbox
Default: DISABLED

Description: This setting will allow DDV subsystem to start its data collection. When disabled, DDV shall not be active. Once enabled, DDV reports shall periodically be generated until this setting is manually turned off. Any change in this category selection should cause all existing DDV raw data to be discarded.

Generate Report

Type: List of following options (select one):
- After 24 Hours (Daily)
- After 12 Hours
- After 8 Hours
- After 6 Hours
- After 4 Hours

Default: Daily

Description: Once enabled, DDV collects raw data and generates reports periodically. This setting controls how often the raw data is processed by DDV and converted into a new report. Any change in this category selection should cause all existing DDV raw data to be discarded.

Enable data collection

Type: Has the following checkboxes. More than one category may be checked.
- Battery
- Thermal
- Fan
- Processor
- Memory
- Storage
- Network

Default: All checkboxes are enabled

Description: This setting will allow the user to control which categories of data will be displayed in the report.

4.2 Workload Analysis

Dell Precision Optimizer 5.0 and later allows the user to characterize their workloads and determine their resource usages. When the user initiates the analysis, Dell Precision Optimizer should collect system resource usage parameters (CPU, Memory, Disk & Graphics).

4.3 CPU Intelligence Reports

Dell Precision Optimizer 5.0 and later allows the user to view enhanced Intel CPU information which includes processor information as well as live data for each logical processor. This data is displayed in the form of line graphs by Dell Precision Optimizer UI.

The UI will use the COM interface to get the following processor information:

- CPU Name
- Number of Sockets

- Number of Physical Cores
- Hyper-Threading State (Enabled/Disabled)
- L1 Cache Size (KB)
- L2 Cache Size (KB)
- L3 Cache Size (KB)
- CPU Utilization per logical processor
- CPU Active Relative Frequency per logical processor (to determine Turbo Residency)
- Processor Queue Length for the system
- Number of System Threads

4.4 Graphics Intelligence Reports

For supported Nvidia and AMD graphics adapters only, Dell Precision Optimizer 5.0 and later allows the user to view enhanced Graphics. This includes graphics adapter and software information as well as live data for each GPU. This data is displayed in the form of line graphs by Dell Precision Optimizer UI.

The UI will use Dell Precision Optimizer interface to get the following GPU information:

- Number of GPUs
- Graphics Driver Version
- Graphics Adapter Name (Active GPU 0 Only)
- Video BIOS Version (Active GPU 0 Only)
- Framebuffer Size (Active GPU 0 Only)

The Graphics live data is available from certain Nvidia & AMD adapters only and that too only when a user is logged on.

NOTE: On some mobile systems with AMD graphics adapters, valid live data may only be displayed when an active load is running on the AMD graphics adapter.

The following live information for each GPU shall be collected and displayed in the form of line graphs.

- GPU Utilization
- GPU Temperature
- GPU Fan #0 Speed (%)
- Video Memory Utilization

4.5 System Health Reports

Dell Precision Optimizer 5.0 and later allows the user to run System Health reports. These are standard Microsoft-provided reports such as a System Report, Battery Report, and Reliability Report. The user should be able to generate a new report or view the last report generated previously. Only users with local administrator privileges can use this option.

This feature will act as a shortcut to existing Microsoft tools. The following reports shall be available from this dashboard:

- System Diagnostic Report containing:
    - diagnostics results listing errors and warning in the system
    - resource usage overview

- System Reliability Report containing:
    - List of Application, Windows & Miscellaneous failures in the last few weeks
    - Informational Events and Warnings during that period
    - Windows Stability Index
- Battery Report containing*1
    - Installed Battery Details
    - Recent Usage & History
    - Battery Capacity & Life Estimates

*1 This feature is available only on Windows 8 and above.

4.6 Smart Notifications

Dell Precision Optimizer 4.0 and later allows the user to enable Smart Notifications. Smart Notifications allow the user to get notifications in any of the following cases:

- Excessive CPU utilization
- Excessive Memory utilization
- Excessive Disk Read/Write operations

These notifications will work only if either System Analysis or Workload Analysis is turned ON. These notifications are generated by examining the data collected during analysis for the previous day.

Therefore, the user may not see any notifications if only Workload Analysis is run for 4 hours.

4.7 Upgrade Options

Dell Precision Optimizer UI provides a new link to Dell support website where a user may view and order optional/upgrade parts for his/her specific platform. The service tag of the system shall be used by the application to determine what upgrades are available. This feature is internally implemented using the **upgratdeOpt.exe** tool.

5. System Maintenance (SM)

Dell Precision Optimizer SM allows the user to filter updates that are seen or applied based on the following criteria derived from DCU:

a) Criticality (Critical, Recommended, Optional)
b) Type (Hardware Drivers, Application, BIOS, Firmware)
c) Category (Audio, Chipset, Input, Network/Bluetooth, Storage, Video, Others)

6. User Feedback

Dell Precision Optimizer UI provides an option to the user to send feedback back to Dell. Dell Precision Optimizer UI provides a link/button which the user can click to initiate this feedback. UI will launch a URL in the browser which will allow the user to use a Dell standard form to provide feedback for Dell Precision Optimizer.

7. Improve Dell Precision Optimizer

The Dell Precision Optimizer Customer Experience Improvement Program allows Dell customers to impact the development of future Dell Precision Optimizer releases. By sharing information with Dell regarding how you use Dell Precision Optimizer, you can contribute to improvements of future versions of the product.

The Dell Precision Optimizer Customer Experience Improvement Program adheres to all of the provisions of the Dell privacy policy. Data collected will be limited to Dell Precision Optimizer usage and the workstation's service tag. No personal information of data will be collected. You may opt in or out of the Program at any time.

This feature is disabled by default.

8. Enterprise Tools

8.1 WMI Providers

Dell Precision Optimizer 5.0 and above includes a WMI provider to allow access to the following information. Please refer to APPENDIX A for MOF descriptions. The following two files are part of the Dell Precision Optimizer package:

- **Dell Precision Optimizer WMI Provider: dpoProv.mof**
- **Dell Precision Optimizer SMS MOF definition file: sms_def_dpo3.mof**

- DDV Reports
- Product Version
- Last Check For Update Time
- Last System Update Time
- Last Check For Profiles
- Profile/Policy Trigger History
- List of Active Profiles
- Smart Notifications

8.2 DPOCMD.EXE

Dell Precision Optimizer 5.0 and later provides CLI tool, **dpoCmd.exe**, to allow the IT administrator the following capabilities:

- Add a new Profile or Policy
- List all Profiles
- Enable or Disable a Profile
- Schedule System Analysis report(s) with specific filters
- Run Dell Precision Optimizer Dell System Update with filters
- Check for Dell Precision Optimizer Dell System Updates with filters
- Export a user created profile
- Import a user created profile
- Upgrade to Premium version
- Enable/Disable UI features using the following CLI options; these are also controlled using new command line switches in Dell Precision Optimizer installer:

Control	Definition	Default	Command Line Switch
ProfileControl	If 0, then do not allow user to enable/disable profiles,	1	PROFCTRL
ProfileUpdate	If 0, then do not allow user to check for new profiles	1	PROFUPD
SystemUpdate	If 0, then do not allow user to check for system updates	1	SYSUPD
DDVControl	If 0, then do not allow user to Enable/Disable System Analysis reports	1	DDVCTRL
UserFeedback	If 0, then do not allow user to send Dell Precision Optimizer feedback	1	USRFB
UpgradeOptions	If 0, then do not allow user to check for upgrade options	1	UPGOPT
WorkloadAnalysis	If 0, then do not allow user to run Workload Analysis	1	WKLANL
IntelCAS	If 0, then do not show Intel CAS Storage plugin link to the user	1	INTELCAS
GfxPlugins	If 0, then do not show GfxPlugin options to the user	1	GFXPLUGINS
ImproveDPO	If 0, then do not show user Improve Dell Precision Optimizer setting	1	IMPROVEDPO
ISVCertDrvr	If 0, then do not allow user to view/install ISV Certified graphics drivers	1	ISVCERTGFX

SmartAlerts	If 0, then do not allow user to enable/disable Smart Alerts	1	SMARTALERT

CLI Usage:

dpoCmd.exe -savePolicy <complete_dpx_path>
dpoCmd.exe -saveProfile <complete_dpx_path>
dpoCmd.exe -listProfiles
dpoCmd.exe -enableProfile <profile_guid>
dpoCmd.exe -disableProfile <profile_guid>
dpoCmd.exe -scheduleReports <numReports> <reportDuration> [-r <ddvSubSystem>] [-r <ddvSubSystem>] ...

where,

<reportDuration> can be one of 0, 4, 6, 8, 12
- 0 means daily report
- 4 means 4 hour report
- 6 means 6 hour report and so on.

-r <ddvSubSystem> will remove that subsystem and the data will not appear in the DDV reports that are generated. <ddvSubSystem> can be one of the following:
- Battery
- Thermal
- Fan
- Processor
- Memory
- Network
- Storage

dpoCmd.exe –cancelReports
dpoCmd.exe -enableFeatures <feature> [<feature> ...]

where <feature> can be one of the following:
- PROFCTRL
- PROFUPD
- SYSUPD
- DDVCTRL
- USRFB
- UPGOPT
- WKLANL
- INTELCAS
- GFXPLUGINS
- IMPROVEDPO
- ISVCERTGFX
- SMARTALERT

dpoCmd.exe -disableFeatures <feature> [<feature> ...]

where <feature> can be one of the following:

PROFCTRL
PROFUPD
SYSUPD
DDVCTRL
USRFB
UPGOPT
WKLANL
INTELCAS
GFXPLUGINS
IMPROVEDPO
ISVCERTGFX
SMARTALERT

dpoCmd.exe -updateNow -criticality:CRO -filter:BDAF -device:ACMSNV <activityLogFileName>
dpoCmd.exe -checkForUpdatesNow -criticality:CRO -filter:BDAF -device:ACMSNV <activityLogFileName>

where -criticality: can be one or more of the following:

C => Critical
R => Recommended
O => Option

where -filter: can be one or more of the following:

B => BIOS
D => Drivers
A => Applications
F => Firmware

where -device: can be one or more of the following:

A => Audio
C => Chipset
M => Mouse/Keyboard
S => Storage
N => Network/Bluetooth
V => Video

dpoCmd.exe -exportProfile <profile_guid or unique_profile_name> <dpzFileName>
dpoCmd.exe -importProfile <dpzFileName>
dpoCmd.exe -upgradeToPremium <licenseKey>

where licenseKey: is an alpha numeric key and not a file that contains the key

8.3 Setup Command Line Switches

Dell Precision Optimizer 5.0 installer provides command line switches to allow IT administrator to control certain behaviors of the client package. This list is mentioned above in Section 8.2.

Setup.exe PROFUPD=0 WKLANL=0	*To install Dell Precision Optimizer, where the user will not be allowed to check for new profiles or run workload analysis.*

In addition, a new options GUI=0, allows the IT administrator to install the Dell Precision Optimizer client without any UI component, i.e. head less mode. The user will not be able to control the software. The IT administrator may use the new CLI tool to enable/disable other run time features.

8.4 SCCM

This is one of the methods used by the IT administrators today to centrally manage their systems and software applications. In this section we will provide examples of how IT Administrators can use SCCM tools to manage the Dell Precision Optimizer application.

NOTE: There are methods and tools other than SCCM in the industry. Use the examples below to manage Dell Precision Optimizer in those environments.

8.4.1 Instructions for creating the Dell Precision Optimizer application package

Here are some steps that you can perform to create a Dell Precision Optimizer package that can be deployed to selected client system in the Enterprise. Note: the exact steps may differ slightly based on the SCCM version that you are using.

a) Download the Dell Precision Optimizer files required for installation.
b) In Configuration Manager Console:
- open the Software Library Page
- Click on Overview folder
- Click on Application Management
- Right click Applications and select: Create Application

c) In the Create Application Wizard
- Select Manually specify the application information
- Give the application a name, i.e. Dell Precision Optimizer5.00.02, click next
- Click next in Application Catalog
- Click add in the Deployment Types page
- In the Create Deployment Type Wizard, select Type: script installer, click next
- Give the deployment type a name, click next
- Type the location of the Dell Precision Optimizer files in the Content Location
- Type the following in Installation Program:
- "PoaInstaller.exe" /s
- In the Detection Methods tab click Add clause
- The detection rule is as follows:
- Setting Type: Registry
  Hive: HKEY_LOCAL_MACHINE
  Key: Software\Wow6432Node\Microsoft\Windows\CurrentVersion\Uninstall\{D66A3355-FEA4-4F60-8BAF-D6CBEDB396D8}

- Click OK to close the Detection Rule window, click Next In the Create Deployment Type Wizard
- Specify the user experience as follows:
  Installation behavior: Install for system
  Login Requirement: Whether or not a user is logged on
  Installation Program Visibility: Normal
- Click Next in the Requirements tab
- Click Next in the Dependencies tab
- Click Next in Summary, verify that the Deployment Type was created successfully and close the Create Deployment Type wizard

d) In the Create Application Wizard, click next in the Deployment Types tab, click next in the Summary Tab and confirm that the application was created successfully

8.4.2 Instructions for Deploying the Application

Once you have created the package, use the following instruction to deploy it to selected clients:

a) Right click the application to deploy and select **Deploy**
b) Select the device collection you would like to install Dell Precision Optimizer on
c) Make sure **Automatically distribute content for dependencies** is checked, click **next**
d) In the Content tab, click **Add** to select the distribution point
e) In the deployment settings tab have the following:
   - Action: Install
   - Purpose: Required
f) In the Scheduling tab click **next**
g) In the User Experience tab select:
   - User notifications: Display in Software Center, and only show notifications for computer restarts
h) Click **next** in the Alerts tab, click **next** in the Summary tab, and verify deployment completion

8.4.3 Verifying Deployment Success in Client systems

a) Open Software Center in the client system, verify that Dell Precision Optimizer is installed (it may take a few minutes for the installation to take place after deploying the application)
b) Go to **C:\\Windows\CCM\Logs** and check **AppDiscovery.Log**, **AppIntent.log**, and **AppEnforce.log** for troubleshooting

8.4.4 Changing Dell Precision Optimizer Client Behavior using DPOCMD.EXE

Here are the steps that you can take to run Dell Precision Optimizer CLI (**dpoCmd.exe**) on a target system to change the behavior of Dell Precision Optimizer software on that system. The following example illustrates the use of **dpoCmd.exe** to enable a Dell Precision Optimizer profile (After Effects by Adobe).

Create a software package first:

1. In the Configuration Manager Console
    a. Open the Software library page
    b. Click on the Overview tab
    c. Open the Application Management tab
    d. Right click Packages and select Create new package
2. In the Create Package and Program Wizard
    a. Set the Name: Enable a Dell Precision Optimizer profile
    b. Specify information about the package and click next
3. In the Program Type tab select Standard program
4. In the Standard Program tab:
    a. Name: Enable Adobe After Effects
    b. Command line:dpoCmd.exe –enableProfile {2F066600-FA52-4F57-890D-2621D39B0BE9}}
    c. Startup folder: **C:\program files\dell\ppo**
    d. Run: Normal
    e. Program can run: Whether or not a user is logged on
    f. Run mode: Run with administrative rights
    g. Drive mode: Runs with UNC name
5. In the Requirements tab select 'This program can run on any platform'
6. Click next, review the package summary and verify the package was created successfully

Deploying "Enable a Dell Precision Optimizer Profile" software package

1. In the Configuration Manager Console
    a. Open the Software library page
    b. Click on the Overview tab
    c. Open the Application Management tab
    d. Click on Packages
2. Right click the "Enable DPO profile" software package and select Deploy
3. In the Deploy Software Wizard:
    a. In the general tab ,click browse to select the device collection, click next
    b. In the content tab, click add to add a distribution point, click next
    c. In the deployment settings tab, have the following:
        i. Action: Install
        ii. Purpose: Required
        iii. Check the 'Send wake-up' packets box
    d. In the scheduling tab select the time of deployment and make sure the 'Rerun behavior is: Always rerun program'. To deploy now, click New and select 'Assign immediately after this event: As soon as possible'
    e. In the User Experience tab make sure the following check boxes are checked
        i. Software Installation
        ii. System restart(if required to complete installation)
        iii. Commit changes at deadline or during a maintenance window (requires restarts)
    f. In the distribution points tab:
        i. Deployment options: Download content from distribution point and run locally
        ii. Deployment options: Download content from distribution point and run locally
        iii. Make sure the 'Allow clients to share content with other clients on the same subnet' is checked
    g. Click next and verify the deployment successfully completed

8.4.5 SSRS Reports

As a system administrator you can create various reports based on the data collected from Dell Precision Optimizer's WMI providers. If this is desired, you can include the sms_def_dpo3.mof to extend the DB definitions and pull corresponding data from Dell Precision Optimizer client systems. You may select some or all the data elements that you will like to review. The default is set to select all Dell Precision Optimizer data elements.

Importing the sms_def_dpo3.mof file to set hardware inventory classes

1. In the Configuration Manager Console
    a. Open the Administration page
    b. Click the Overview tab
    c. Click the Site Configuration tab and select Client Settings
2. Right click an existing Client Setting and select properties or create a new Custom Client Setting
3. In the Hardware Inventory tab select 'Set Classes'
4. Select Import and browse to the location of the sms_def_dpo3.mof file
5. Click Ok to import the file and close the Hardware Inventory Classes Window

Once collected data is populated in the SQL database, you can create different type of Dell Precision Optimizer reports. A handful of samples (*.RDL) are provided with the Dell Precision Optimizer software. You can import these RDL files, connect them to your SQL database and run the reports.

To Import an RDL file

1. Open SQL server data tools
2. In the Solution Explorer right click the folder in which you would like to add the RDL file
    a. Select Add Existing Item
    b. Select the RDL file
3. Once the file is imported, open the file and select the Design tab

To ensure the RDL file is using the right data source

1. In the Report Data pane, click on Datasets and right click one of the data sets and select 'Dataset Properties'
2. In the Dataset Properties window:
    a. Make sure 'Use a dataset embedded in my report' is selected
    b. Under Data source, click 'New…'
    c. In the Data Source Properties window select 'Use shared data source reference' and select the correct data source
    d. Click ok
3. Repeat steps 1 and 2 for all other data sets in the Datasets folder

Here are some of the screen shots of the reports that are provided with Dell Precision Optimizer:

Disk Information

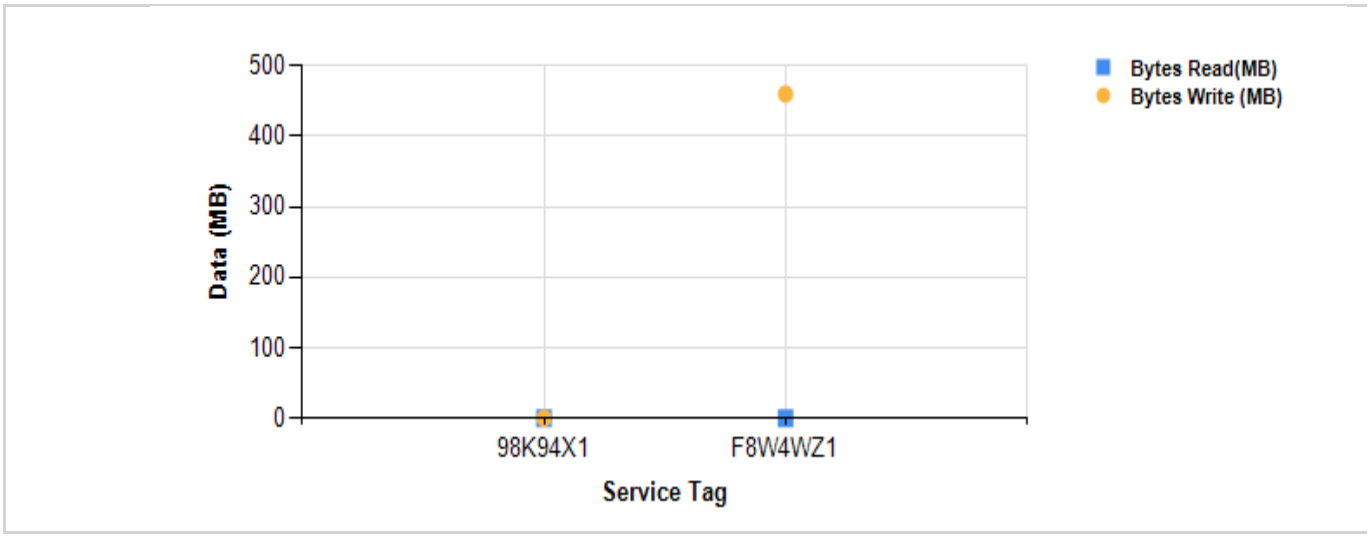
Switch

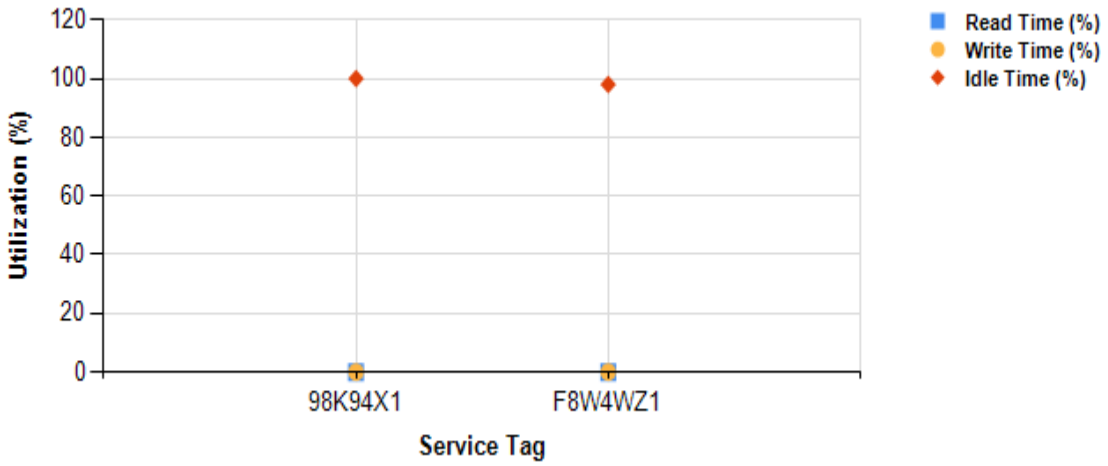
This report displays disk information across multiple systems using their latest system analysis report.

Service Tag	Bytes Read(MB)	Bytes Write(MB)	Read Time(%)	Write Time(%)	Idle Time (%)
98K94X1	0	0	0	0	100
F8W4WZ1	0	460	0	0	98

Disk Information

This report displays disk information across multiple systems using their latest system analysis report.





Disk Information

Switch

This report displays disk information for a single system across multiple reports.

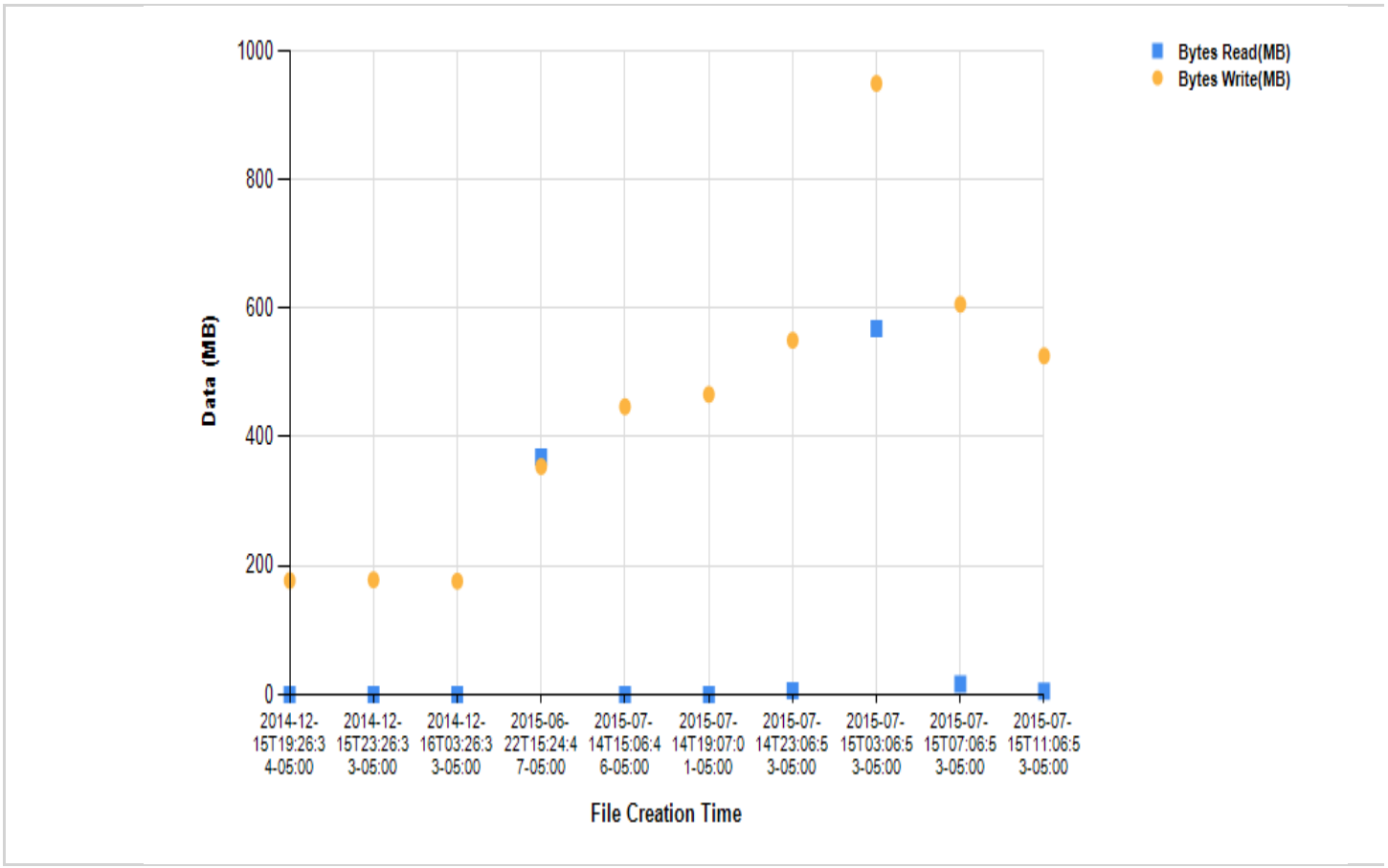
Date Reported	Bytes Read (MB)	Bytes Write (MB)	Read Time (%)	Write Time (%)	Idle Time (%)	Hours On
2015-07-15T11:06:53-05:00	5	526	0	0	98	4
2015-07-15T07:06:53-05:00	16	606	0	1	98	4
2015-07-15T03:06:53-05:00	568	949	0	0	98	3.1
2015-07-14T23:06:53-05:00	6	550	0	0	98	4
2015-07-14T19:07:01-05:00	0	466	0	0	98	4
2015-07-14T15:06:46-05:00	0	447	0	0	98	3.95

2015-06-22T15:24:47-05:00	369	354	0	0	96	3.48
2014-12-16T03:26:33-05:00	0	176	0	0	99	3.43
2014-12-15T23:26:33-05:00	0	178	0	0	99	4
2014-12-15T19:26:34-05:00	0	177	0	0	98	3.98

Switch

Disk Information

This report displays disk information for a single system across multiple reports.



8.5 KACE

This is one of the methods used by the IT administrators today to centrally manage their systems and software applications. In this section we will provide examples of how IT Administrators can use KACE Appliance to manage the Dell Precision Optimizer application.

NOTE: The following steps were verified on KACE Appliance 6.4.120756 K1000. If you are using a different version of KACE, then the actual steps may vary slightly.

8.5.1 Instructions for deploying Dell Precision Optimizer using KACE

An IT administrator could use the following procedure to deploy Dell Precision Optimizer application on select client systems in their domain.

Create an installation script

From your KACE Appliance console:

- Navigate to Scripting->Scripts->Choose Action->New
- On the Script Detail page enter the following information:

Name -> Install DPO
Enabled -> Check the box
Type -> Online K-Script
Description -> This script will install DPO client software…
Deploy -> None
Operating Systems -> Uncheck Select Specific Operating Systems and select Microsoft Windows
(Alternate) Operating Systems -> Select specific Windows OSes for deployment
Windows Run As -> Local System
Notify -> None
Schedule -> None
Dependencies -> Add all DPO package files as new dependencies
Tasks -> Select New Task
Verify -> Click Add, then select “Launch a program”, enter the following data:

Directory	$(KACE_DEPENDENCY_DIR)
File	PoaInstaller.exe
Wait for Completion	CHECKED
Visible	UNCHECKED
Parameters	LOGFILE=c:\temp\dpo.log /s

<Save Changes>
On Success -> None
Remediation -> None
On Remediation Success -> None
One Remediation Failure -> None
Tasks -> Select New Task
Verify -> Click Add, then select “Verify a file exists”, enter the following data:

Directory	C:\Program Files\Dell\DPO

File dpoCmd.exe
<Save Changes>
On Success -> None
Remediation -> None
On Remediation Success -> None
One Remediation Failure -> None
Save

Run installation script on select systems

From your KACE Appliance console:

- Scripting -> Run Now
- Select “Install DPO” from the Scripts drop down menu
- Under Labels, select a label of Windows devices where you wish to deploy Dell Precision Optimizer OR manually select a set of systems
- Click Run Now
- Click Save

This will initiate the deployment of Dell Precision Optimizer client software on selected systems. These steps are for reference only can could be easily customized for your need.

8.5.2 Changing Dell Precision Optimizer Client Behavior using DPOCMD.EXE

Here are the steps that you can take to run Dell Precision Optimizer CLI (dpoCmd.exe) on a target system to change the behavior of Dell Precision Optimizer software on that system. The following example illustrates the use of dpoCmd.exe to enable a Dell Precision Optimizer profile (After Effects by Adobe).

Create an installation script

From your KACE Appliance console:

- Navigate to Scripting->Scripts->Choose Action->New
- On the Script Detail page enter the following information:

Name -> Enable DPO Profile After Effects
Enabled -> Check the box
Type -> Online K-Script
Description -> This script will enable After Effects profile under DPO client software…
Deploy -> None
Operating Systems -> Uncheck Select Specific Operating Systems and select Microsoft Windows
(Alternate) Operating Systems -> Select specific Windows OSes for deployment
Windows Run As -> Local System
Notify -> None
Schedule -> None
Dependencies -> None
Tasks -> Select New Task
Verify -> Click Add, then select “Launch a program”, enter the following data:

Directory C:\Program Files\Dell\PPO
File dpoCmd.exe
Wait for Completion CHECKED
Visible UNCHECKED
Parameters -enableProfile {2F066600-FA52-4F57-890D-2621D39B0BE9}
<Save Changes>
On Success -> None
Remediation -> None
On Remediation Success -> None
One Remediation Failure -> None
Tasks -> Select New Task
Verify -> Click Add, then select "Verify a file exists", enter the following data:
Directory C:\Program Files\Dell\PPO
File dpoCmd.exe
<Save Changes>
On Success -> None
Remediation -> None
On Remediation Success -> None
One Remediation Failure -> None
Save

Run this script on select systems

From your KACE Appliance console:

- Scripting -> Run Now
- Select "Enable DPO Profile After Effects" from the Scripts drop down menu
- Under Labels, select a label of Windows devices where you wish to deploy Dell Precision Optimizer OR manually select a set of systems
- Click Run Now

8.5.3 Custom Reports

Here are some examples on how you can collect some data from Dell Precision Optimizer clients using its WMI classes and create custom reports. Dell Precision Optimizer provides a large set of WMI classes to allow an IT administrator to create a huge variety of reports. This following illustrates the basic steps to create a Dell Precision Optimizer report. An IT administrator can customize what data needs to be collected, how frequently and finally how to present that data.

Create Custom Inventory Rules

From your KACE Appliance console:

- Inventory -> Software
- Choose Action - > New
- Software Details page, enter the following information

Name DPO Sample Inventory
Version v1
Publisher Dell
Supporting Operating Systems Select OSes
Custom Inventory Rule

ShellCommandTextReturn(wmic /namespace:\\root\cimv2\DPO Path DPO_Profiles get /ALL)

Save

- Click back into the new custom inventory record and hover over the record just created. Note the ID# at the end of the URL. URL with the ID# is visible at the lower left hand corner of the page. You will need this later for creating the report.

Force Inventory Collection

From your KACE Appliance console:

- Inventory -> Devices
- Select the device(s) where Dell Precision Optimizer is installed (you could use a SmartLabel for this purpose)
- Choose Action -> Force Inventory
- Once the inventory cycle has completed, navigate into one of the selected devices that was online
- Device Detail page -> Software -> expand Custom Inventory Fields -> This should show a list of profiles and their current state

NOTE: Now that you have Script and Custom Inventory setup, and completed a Custom Inventory cycle on all desired systems, it is time to take advantage of your K1000s reporting capabilities! While you can definitely pull the Dell Precision Optimizer information out of the K1000 using a Wizard based report, we are going to use a custom SQL report to process and filter our information into a useful report.

Create Report

From your KACE Appliance console:

- Reporting -> Reports
- Choose Action -> New (SQL)
- Report Detail page -> Enter the following data

Title Dell Precision Optimizer Sample Profile Report
Description This is a sample Dell Precision Optimizer report …
Category <any> or New Category -> DPO Reports
SQL

```
SELECT
MACHINE.NAME AS Name,
MACHINE.IP AS Ip,
MACHINE.USER_LOGGED AS LoggedUser,
MACHINE.CS_MANUFACTURER AS Manufacturer,
MACHINE.CS_MODEL AS Model,
MACHINE_CUSTOM_INVENTORY.STR_FIELD_VALUE AS MACHINE_CUSTOM_INVENTORY_XXXX,
COUNT(MACHINE_CUSTOM_INVENTORY.STR_FIELD_VALUE) AS Total_Devices
```

```
FROM MACHINE_CUSTOM_INVENTORY
JOIN MACHINE ON MACHINE.ID = MACHINE_CUSTOM_INVENTORY.ID
WHERE MACHINE_CUSTOM_INVENTORY.SOFTWARE_ID = XXXX
GROUP BY MACHINE_CUSTOM_INVENTORY.STR_FIELD_VALUE
ORDER BY MACHINE.CS_MANUFACTURER ASC, MACHINE.CS_MODEL ASC
```

Replace XXXX with the ID# of your custom inventory which was collected above when we created the Custom Inventory Rule.

- Save

Run Report

From your KACE Appliance console:

- Reporting -> Reports
- Search -> Enter “DPO”, this will list your reports
- Select the desired report, e.g. DPO Sample Profile Report, and click on report format you want, say HTML

APPENDIX A - dpoCmd.exe Exit Codes

```
typedef enum {
    EXIT_CODE_SUCCESS                               = (int) 0,
    EXIT_CODE_ERROR_GET_COMP_NAME                   = (int) 1,
    EXIT_CODE_COINIT_FAILED                         = (int) 2,
    EXIT_CODE_PROFILE_NOT_FOUND                     = (int) 3,
    EXIT_CODE_ERROR                                 = (int) 4,
    EXIT_CODE_ERROR_GET_COMP_SID                    = (int) 5,
    EXIT_CODE_COINIT_SECURITY_FAILED                = (int) 6,
    EXIT_CODE_MISSING_COM_INTERFACE                 = (int) 7,
    EXIT_CODE_PROFILE_GETSTATE_FAILED               = (int) 8,
    EXIT_CODE_PROFILE_SETSTATE_FAILED               = (int) 9,

    EXIT_CODE_MISSING_STORE                         = (int) 40,
    EXIT_CODE_NULL_STORE                            = (int) 41,
    EXIT_CODE_READFILE_FAILED                       = (int) 42,
    EXIT_CODE_WRITEFILE_FAILED                      = (int) 43,
    EXIT_CODE_OUT_OF_MEM                            = (int) 44,
    EXIT_CODE_SAVE_STORE_FAILED                     = (int) 45,
    EXIT_CODE_ENCRYPTION_FAILED                     = (int) 46,

    EXIT_CODE_DDV_REPORTS_ALREADY_SCHEDULED         = (int)60,
    EXIT_CODE_ENABLE_DDV_FAILED                     = (int) 61,
    EXIT_CODE_SET_DDV_FILTERS_FAILED                = (int) 62,
    EXIT_CODE_INVALID_DDV_REPORT_DURATION           = (int) 63,
    EXIT_CODE_SET_REPORT_FREQ_FAILED                = (int) 64,
    EXIT_CODE_SET_REPORT_NUM_FAILED                 = (int) 65,
    EXIT_CODE_DISABLE_DDV_FAILED                    = (int) 66,
    EXIT_CODE_ERROR_ENUM_DDV_SUBSYSTEMS             = (int) 67,

    EXIT_CODE_DO_UPDATE_FAILED                      = (int) 70,
    EXIT_CODE_PREV_CHECK_FAILED                     = (int) 71,
    EXIT_CODE_PREV_UPDATE_ACTION_IN_PROGRESS        = (int) 72,
    EXIT_CODE_REGISTER_EVENTS_FAILED                = (int) 73,
    EXIT_CODE_CHECK_UPDATE_FAILED                   = (int) 74,

    EXIT_CODE_SET_FEATURE_FAILED                    = (int) 80,

    EXIT_CODE_UI_IS_RUNNING                         = (int) 98,
    EXIT_CODE_USAGE_ERROR                           = (int) 99
} EXIT_CODE;
```

APPENDIX B - WMI Class Definition Files

```
/*****************************************************************
 * DPOProv.mof
 * Last Updated: 03/06/2015
 * This file defines the classes exposed by "dpoProv".
 *****************************************************************/

#pragma autorecover

#pragma namespace("\\\\.\\root\\cimv2")
instance of __Namespace
{
        Name = "DPO" ;
} ;

#pragma namespace("\\\\.\\root\\cimv2\\DPO")

/*****************************************************************
 * DPO_HardwareInfo
 * There is one instance of this class for each summary
 * file present on the system.
 * The instance will contain all the hardware data and
 * the statistics from the summary file.
 * HardwareInfoGUID is the unique ID from the summary file.
 * HardwareInfoGUID associates this instance with
 * with instances of other dependent classes that may have
 * multiple instances (eg. DPO_Monitor. DPO_BiosInternalLogs etc.)
 *****************************************************************/
[Description("An instance of this class contains all the hardware data and "
 " statistics from a summary file."),
 Dynamic,Provider("DPOProv") ]
class DPO_HardwareInfo
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                HardwareInfoGUID;

        [Description("Revision of Dell Data Vault.")]
        string                          DDV_Revision;

        [Description("Date/time when the summary file was created.")]
        string                          File_Creation_Datetime;

        [Description("Date/time when Dell Data Vault began collecting the raw data.")]
        string                          Data_Begining_Date;

        [Description("Date/time when Dell Data Vault stopped collecting the raw data and generated the statistics.")]
        string                          Data_Ending_Date;

        [Description("Indicates whether this summary was created on service startup, regular timer or on demand.")]
        string                          Summary_Type;

        [Description("Service Tag of the system obtained from the BIOS.")]
        string                          System_Service_Tag;

        [Description("Customer Name 1")]
        string                          Customer_Name_1;

        [Description("Customer Name 2")]
        string                          Customer_Name_2;

        [Description("Customer Name 3")]
        string                          Customer_Name_3;
```

```
        [Description("Customer specific data 1")]
        string                  Customer_Defined_1;

        [Description("Customer specific data 2")]
        string                  Customer_Defined_2;

        [Description("Customer specific data 3")]
        string                  Customer_Defined_3;

        [Description("System Model")]
        string                  System_Model;

        [Description("ePPID of the motherboard obtained from the BIOS.")]
        string                  Motherboard_ePPID;

        [Description("Current BIOS Version.")]
        string                  BIOS_Version;

        [Description("Type of the system eg. Laptop or Desktop")]
        string                  System_Type;

        [Description("Serial number of the CPU.")]
        string                  Processor_Serial_Number;

        [Description("Processor name.")]
        string                  Processor_Information;

        [Description("Processor speed.")]
        string                  Processor_Speed;

        [Description("Average of the percentage LCD brightness when the system was on AC.")]
        sint16                  LCD_Avg_Brightness_AC_Pct;

        [Description("Average of the percentage LCD brightness when the system was on battery.")]
        sint16                  LCD_Avg_Brightness_DC_Pct;

        [Description("Video Controller name.")]
        string                  Video_Controller;

        [Description("Video conroller memory size.")]
        sint32                  Video_RAM_Bytes;

        [Description("Number of displays on the system.")]
        sint16                  Number_of_Displays;

        [Description("Operating system, 32bit vs 64bit & system locale information.")]
        string                  Operating_System;

        [Description("AC adapter power (for notebooks only).")]
        string                  AC_Adapter_Type_W;

        [Description("Number of hours the system was on.")]
        real32                  Hours_On;

        [Description("Number of hours the system was on when powered by AC.")]
        real32                  Hours_On_AC;

        [Description(" Number of hours the system was on when powered by battery (for notebooks only).")]
        real32                  Hours_On_Batt;

        [Description("Number of times the AC adapter was inserted in the system (for notebooks only).")]
        sint16                  No_Of_AC_Insertions;

        [Description("Number of times the primary battery was inserted into the system (for notebooks only).")]
// NameChange  sint16                   Number_Of_Battery_Insertions;
```

```
sint16                          Num_Battery_Insertions;

[Description("Number of times the system was running on battery (for notebooks only).")]
sint16                          Number_Of_Battery_Sessions;

[Description("Number of battery sessions where the session was between 0 to 30 mins (for notebooks only).")]
sint16                          Battery_Sessions_0_30mins;

[Description("Number of battery sessions where the session was between 30 mins to 1 hr(for notebooks only).")]
sint16                          Battery_Sessions_30min_1hr;

[Description("Number of battery sessions where the session was between 1 to 2 hrs (for notebooks only).")]
sint16                          Battery_Sessions_1_2hr;

[Description("Number of battery sessions where the session was between 2 to 3 hrs(for notebooks only).")]
sint16                          Battery_Sessions_2_3hr;

[Description("Number of battery sessions where the session was between 3 to 4 hrs (for notebooks only).")]
sint16                          Battery_Sessions_3_4hr;

[Description("Number of battery sessions where the session was between 4 to 6 hrs (for notebooks only).")]
sint16                          Battery_Sessions_4_6hr;

[Description("Number of battery sessions where the session was between 6 to 8 hrs (for notebooks only).")]
sint16                          Battery_Sessions_6_8hr;

[Description("Number of battery sessions where the session was between 8 to 12 hrs (for notebooks only).")]
sint16                          Battery_Sessions_8_12hr;

[Description("Number of battery sessions where the session was greater than 12 hrs (for notebooks only).")]
sint16                          Battery_Sessions_GT12hr;

[Description("Number of system shutdowns.")]
sint16                          S5_Requests;

[Description("Number of times the system entered Hibernate state (S4).")]
sint16                          S4_Requests;

[Description("Total time the system was in Hibernate state (S4).")]
real32                          S4_mins;

[Description("Number of times the system was in Hibernate state (S4) where the time in S4 was between 0 to 30 mins.")]
sint16                          S4_Event_Bin_0_30_mins;

[Description("Number of times the system was in Hibernate state (S4) where the time in S4 was between 30 mins to 1 hr.")]
sint16                          S4_Event_Bin_30_60_mins;

[Description("Number of times the system was in Hibernate state (S4) where the time in S4 was between 1 hr to 2 hrs.")]
sint16                          S4_Event_Bin_60_120_mins;

[Description("Number of times the system was in Hibernate state (S4) where the time in S4 was between 2 to 4 hrs.")]
sint16                          S4_Event_Bin_120_240_mins;

[Description("Number of times the system was in Hibernate state (S4) where the time in S4 was between 4 to 8 hrs.")]
sint16                          S4_Event_Bin_240_480_mins;

[Description("Number of times the system was in Hibernate state (S4) where the time in S4 was between 8 to 16 hrs.")]
sint16                          S4_Event_Bin_480_960_mins;

[Description("Number of times the system was in Hibernate state (S4) where the time in S4 was greater than 16 hrs.")]
sint16                          S4_Event_Bin_GT_960_mins;

[Description("Number of times the system entered Standby/Sleep state (S3).")]
sint16                          S3_Requests;

[Description("Total time the system was in Standby/Sleep state (S3).")]
```

```
real32                  S3_mins;

[Description("Number of times the system was in Standby/Sleep state (S3) where the time in S3 was between 0 to 30 mins.")]
sint16                  S3_Event_Bin_0_30_mins;

[Description("Number of times the system was in Standby/Sleep state (S3) where the time in S3 was between 30 mins to 1 hr.")]
sint16                  S3_Event_Bin_30_60_mins;

[Description("Number of times the system was in Standby/Sleep state (S3) where the time in S3 was between 1 hr to 2 hrs.")]
sint16                  S3_Event_Bin_60_120_mins;

[Description("Number of times the system was in Standby/Sleep state (S3) where the time in S3 was between 2 to 4 hrs.")]
sint16                  S3_Event_Bin_120_240_mins;

[Description("Number of times the system was in Standby/Sleep state (S3) where the time in S3 was between 4 to 8 hrs.")]
sint16                  S3_Event_Bin_240_480_mins;

[Description("Number of times the system was in Standby/Sleep state (S3) where the time in S3 was between 8 to 16 hrs.")]
sint16                  S3_Event_Bin_480_960_mins;

[Description("Number of times the system was in Standby/Sleep state (S3) where the time in S3 was greater than 16 hrs.")]
sint16                  S3_Event_Bin_GT_960_mins;

[Description("Average CPU comcumption for all processors combined.")]
real32                  Avg_CPU_Consumption;

[Description("Number of times the CPU consumption was 0%.")]
sint16                  CPU_0_Pct;

[Description("Number of times the CPU consumption was between 0 to 20%.")]
sint16                  CPU_1_20_Pct;

[Description("Number of times the CPU consumption was between 20 to 40%.")]
sint16                  CPU_20_40_Pct;

[Description("Number of times the CPU consumption was between 40 to 60%.")]
sint16                  CPU_40_60_Pct;

[Description("Number of times the CPU consumption was between 60 to 80%.")]
sint16                  CPU_60_80_Pct;

[Description("Number of times the CPU consumption was between 80 to 100%.")]
sint16                  CPU_80_100_Pct;

[Description("Average CPU throttle (for all processors combined).")]
real32                  Avg_CPU_Throttle;

[Description("Number of times the CPU throttle was 0%.")]
sint16                  Throttle_0_Pct;

[Description("Number of times the CPU throttle was between 0 to 25%.")]
sint16                  Throttle_1_25_Pct;

[Description("Number of times the CPU throttle was between 25 to 50%.")]
sint16                  Throttle_25_50_Pct;

[Description("Number of times the CPU throttle was between 50 to 75%.")]
sint16                  Throttle_50_75_Pct;

[Description("Number of times the CPU throttle was between 75 to 100%.")]
sint16                  Throttle_75_100_Pct;

[Description("Percentage of time the processor (all processors combined) was in C1 state.")]
sint16                  C1_State_Pct;

[Description("Percentage of time the processor (all processors combined) was in C2 state.")]
```

```
sint16                  C2_State_Pct;

[Description("Percentage of time the processor (all processors combined) was in C3 state.")]
sint16                  C3_State_Pct;

[Description("Percentage of time the processor (all processors combined) was in C0 state.")]
sint16                  C0_State_Pct;

[Description("Number of LID transitions. One open-close is considered as one transition.")]
sint16                  Lid_Transitions;

[Description("Number of hours the system was ON with LID open.")]
real32                  Lid_Hours_Open;

[Description("Number of hours the system was ON with LID closed.")]
real32                  Lid_Hours_Closed;

[Description("Number of dock events.")]
sint16                  Number_Dock_Events;

[Description("Total system RAM memory.")]
string                  System_RAM_Bytes;

[Description("Total system RAM memory in GB.")]
real32                  System_RAM_GB;

[Description("Percentage of time the system had to access hard disk to resolve page faults.")]
sint16                  pgs_per_sec_pct;

[Description("Minimum number of pages read from or written to the disk to resolve hard page faults.")]
sint32                  min_pgs_per_sec;

[Description("Maximum number of pages read from or written to the disk to resolve hard page faults.")]
sint32                  max_pgs_per_sec;

[Description("Average number of pages read from or written to the disk to resolve hard page faults.")]
real32                  avg_pgs_per_sec;

[Description("Percentage of time the system had between 0 to 256 MB of free physical memory.")]
real32                  FreeMem_0_256MB_Pct;

[Description("Percentage of time the system had between 256 MB to 512 MB of free physical memory.")]
real32                  FreeMem_256_512MB_Pct;

[Description("Percentage of time the system had between 512 MB to 768 MB of free physical memory.")]
real32                  FreeMem_512_768MB_Pct;

[Description("Percentage of time the system had between 768 MB to 1024 MB of free physical memory.")]
real32                  FreeMem_768_1024MB_Pct;

[Description("Percentage of time the system had between 1024 MB to 1280 MB of free physical memory.")]
real32                  FreeMem_1024_1280MB_Pct;

[Description("Percentage of time the system had between 1280 MB to 1536 MB of free physical memory.")]
real32                  FreeMem_1280_1536MB_Pct;

[Description("PPercentage of time the system had between 1536 MB to 1792 MB of free physical memory.")]
real32                  FreeMem_1536_1792MB_Pct;

[Description("Percentage of time the system had between 1792 MB to 2048 MB of free physical memory.")]
real32                  FreeMem_1792_2048MB_Pct;

[Description("Percentage of time the system had between 2048 MB to 2304 MB of free physical memory.")]
real32                  FreeMem_2048_2304MB_Pct;

[Description("Percentage of time the system had between 2304 MB to 2560 MB of free physical memory.")]
```

```
        real32                  FreeMem_2304_2560MB_Pct;

        [Description("Percentage of time the system had between 2560 MB to 2816 MB of free physical memory.")]
        real32                  FreeMem_2560_2816MB_Pct;

        [Description("Percentage of time the system had between 2816 MB to 3072 MB of free physical memory.")]
        real32                  FreeMem_2816_3072MB_Pct;

        [Description("Percentage of time the system had more than 3072 MB of free physical memory.")]
        real32                  FreeMem_GT3072MB_Pct;

        [Description("Percentage of time the system had between 0 to 256 MB of physical memory available to processes running on the computer.")]
        real32                  AvailMem_0_256MB_Pct;

        [Description("Percentage of time the system had between 256 MB to 512 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_256_512MB_Pct;

        [Description("Percentage of time the system had between 512 MB to 768 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_512_768MB_Pct;

        [Description("Percentage of time the system had between 768 MB to 1024 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_768_1024MB_Pct;

        [Description("Percentage of time the system had between 1024 MB to 1280 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_1024_1280MB_Pct;

        [Description("Percentage of time the system had between 1280 MB to 1536 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_1280_1536MB_Pct;

        [Description("PPercentage of time the system had between 1536 MB to 1792 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_1536_1792MB_Pct;

        [Description("Percentage of time the system had between 1792 MB to 2048 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_1792_2048MB_Pct;

        [Description("Percentage of time the system had between 2048 MB to 2304 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_2048_2304MB_Pct;

        [Description("Percentage of time the system had between 2304 MB to 2560 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_2304_2560MB_Pct;

        [Description("Percentage of time the system had between 2560 MB to 2816 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_2560_2816MB_Pct;

        [Description("Percentage of time the system had between 2816 MB to 3072 MB of physical memory available to processes running on the
computer.")]
        real32                  AvailMem_2816_3072MB_Pct;

        [Description("Percentage of time the system had more than 3072 MB of physical memory available to processes running on the computer.")]
        real32                  AvailMem_GT3072MB_Pct;

        [Description("Average Processor Queue Length.")]
        real32                  Average_PQL;

        [Description("Minimum Processor Queue Length.")]
        sint16                  Min_PQL;
```

```
        [Description("Maximum Processor Queue Length.")]
        sint16                          Max_PQL;

        [Description("Percentage of time the system has PQL = 0.")]
        real32                          PQL_0_Pct;

        [Description("Percentage of time the system has PQL = 1.")]
        real32                          PQL_1_Pct;

        [Description("Percentage of time the system has PQL = 2.")]
        real32                          PQL_2_Pct;

        [Description("Percentage of time the system has PQL = 3.")]
        real32                          PQL_3_Pct;

        [Description("Percentage of time the system has PQL = 4.")]
        real32                          PQL_4_Pct;

        [Description("Percentage of time the system has PQL = 5.")]
        real32                          PQL_5_Pct;

        [Description("Percentage of time the system has PQL between 5 and 10.")]
        real32                          PQL_5_10_Pct;

        [Description("Percentage of time the system has PQL between 10 and 20.")]
        real32                          PQL_10_20_Pct;

        [Description("Percentage of time the system has PQL > 20.")]
        real32                          PQL_GT20_Pct;

        [Description("Average value of total system thread count.")]
        real32                          Average_ThreadCount;

        [Description("Minimum value of total system thread count.")]
        sint64                          Min_ThreadCount;

        [Description("Maximum value of total system thread count.")]
        sint64                          Max_ThreadCount;

        [Description("Standard Deviation value of total system thread count.")]
        real32                          Std_Dev_ThreadCount;

        [Implemented]
    void DeleteInstance ();
};

/*************************************************************
 * DPO_Monitor
 * This has the monitor information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *************************************************************/
[Description("Monitor information from the summary log file. This information is extracted from the EDID data"
" in the registry"),
 Dynamic,Provider("DPOProv") ]
class DPO_Monitor
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                        HardwareInfoGUID;

        [
         Description("Monitor index number, starting from 0."),
         Key
        ] sint16                        Index;
```

```
        [Description("Type of monitor (Dell or Non-Dell).")]
        string                          Monitor_Type;

        [Description("Model name of the monitor.")]
        string                          Model_Name;

        [Description("Serial number of the monitor.")]
        string                          Serial;

        [Description("Any vendor specific monitor data.")]
        string                          Vendor_Specific_Data;
};

/*****************************************************************
 * DPO_HardwareInfoToMonitor
 * This class associates DPO_Monitor instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[
Association : ToInstance,
Description("This class associates DPO_Monitor instance(s) "
" with an instance of DPO_HardwareInfo."),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToMonitor
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_Monitor                         REF         Dependent;
};

/*****************************************************************
 * DPO_BiosInternalLogs
 * This has the BIOS logs information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("BIOS logs: All system logs such as BIOS, Diagnostics, IPMI, SMBIOS, SPD logs etc."),
 Dynamic,Provider("DPOProv") ]
class DPO_BiosInternalLogs
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                HardwareInfoGUID;

        [Description("Source of bios log entry. E.g. BIOS, diagnostics, IPMI etc.")]
        string                          Name;

        [Description("BIOS log entry's time stamp.")]
        string                          Time;

        [Description("BIOS log sub type based on source of current log entry.")]
        string                          LogType;

        [Description("Event Code.")]
        string                          EventCode;

        [Description("Description of current log entry.")]
        string                          Descr;
};

/*****************************************************************
 * DPO_HardwareInfoToBiosInternalLogs
 * This class associates DPO_HardwareInfoToBiosInternalLogs
 * instance(s) with an instance of DPO_HardwareInfo.
```

```
 ************************************************************/
[
Association : ToInstance,
Description("This class associates DPO_HardwareInfoToBiosInternalLogs"
" instance(s) with an instance of DPO_HardwareInfo."),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToBiosInternalLogs
{
  [key] DPO_HardwareInfo              REF        Antecedent;
  [key] DPO_BiosInternalLogs          REF        Dependent;
};

/*****************************************************************
 * DPO_WWAN
 * This has the Wireless WAN adapter information from a summary
 * log. There may be multiple instances of this class for each
 * summary file.
 *****************************************************************/
[Description("Wireless WAN adapter information."),
 Dynamic,Provider("DPOProv") ]
class DPO_WWAN
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                            HardwareInfoGUID;

        [Description("Device name.")]
        string                              Device_Name;

        [Description("IMEI number.")]
        string                              IMEI;
};

/*****************************************************************
 * DPO_HardwareInfoToWWAN
 * This class associates DPO_WWAN instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[
Association : ToInstance,
Description("This class associates DPO_WWAN instance(s) with "
" an instance of DPO_HardwareInfo."),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToWWAN
{
  [key] DPO_HardwareInfo REF          Antecedent;
  [key] DPO_WWAN                              REF        Dependent;
};

/*****************************************************************
 * DPO_Battery
 * This has the battery information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Battery information including charge, discharge and dwell statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_Battery
{
        [
         Description("Unique ID from the summary file."),
         Key
```

```
        ] string                        HardwareInfoGUID;

        [
         Description("Index number of the battery device starting from 1."),
         Key
        ] sint16                        Index;

        [Description("Manufacture date.")]
        string                          Manufacture_Date;

        [Description("Serial number.")]
        string                          Serial_Number;

        [Description("Chemistry.")]
        string                          Chemistry;

        [Description("Design Capacity in mAH.")]
        string                          Design_Capacity_mAH;

        [Description("Battery name.")]
        string                          Name;

        [Description("Manufacturer's name.")]
        string                          Mfg_Name;

        [Description("Full charge capacity of the battery.")]
        sint32                          FullChargeCapacity;

        [Description("Battery cycle count.")]
        sint16                          Cycle_Count;

        [Description("Total time (in minutes) the battery was in discharge state.")]
        real32                          Discharge_Time_mins;

        [Description("Number of times the discharge depth was between 0 to 5%.")]
        sint16                          Discharge_Depth_0_5_Pct;

        [Description("Number of times the discharge depth was between 5 to 10%.")]
        sint16                          Discharge_Depth_5_10_Pct;

        [Description("Number of times the discharge depth was between 10 to 20%.")]
        sint16                          Discharge_Depth_10_20_Pct;

        [Description("Number of times the discharge depth was between 20 to 40%.")]
        sint16                          Discharge_Depth_20_40_Pct;

        [Description("Number of times the discharge depth was between 40 to 60%.")]
        sint16                          Discharge_Depth_40_60_Pct;

        [Description("Number of times the discharge depth was between 60 to 80%.")]
        sint16                          Discharge_Depth_60_80_Pct;

        [Description("Number of times the discharge depth was between 80 to 100%.")]
        sint16                          Discharge_Depth_80_100_Pct;

        [Description("Number of times the start of discharge was between 100 to 94%.")]
    //NameChange   sint16                Discharge_Start_Point_100_94_Pct;
        sint16                          Discharge_StartPt_GT_94_Pct;

        [Description("Number of times the start of discharge was between 94 to 70%.")]
    //NameChange   sint16                Discharge_Start_Point_94_70_Pct;
        sint16                          Discharge_StartPt_94_70_Pct;

        [Description("Number of times the start of discharge was between 70 to 50%.")]
    //NameChange   sint16                Discharge_Start_Point_70_50_Pct;
        sint16                          Discharge_StartPt_70_50_Pct;
```

```
        [Description("Number of times the start of discharge was between 50 to 30%.")]
// NameChange  sint16                Discharge_Start_Point_50_30_Pct;
        sint16                       Discharge_StartPt_50_30_Pct;

        [Description("Number of times the start of discharge was between 30 to 10%.")]
// NameChange  sint16                Discharge_Start_Point_30_10_Pct;
        sint16                       Discharge_StartPt_30_10_Pct;

        [Description("Number of times the start of discharge was between 10 to 0%.")]
// NameChange  sint16                Discharge_Start_Point_0_10_Pct;
        sint16                       Discharge_StartPt_0_10_Pct;

        [Description("Number discharge sessions where final RSOC was less than 15%.")]
// NameChange  sint16                Discharge_Sessions_With_End_10_15;
        sint16                       Discharge_Sess_End_10_15;

        [Description("Number discharge sessions where final RSOC was less than 10%.")]
// NameChange  sint16                Discharge_Sessions_With_End_5_10;
        sint16                       Discharge_Sess_End_5_10;

        [Description("Number discharge sessions where final RSOC was less than 5%.")]
// NameChange  sint16                Discharge_Sessions_With_End_LT_5;
        sint16                       Discharge_Sess_End_LT_5;

        [Description("Average temperature during battery discharge.")]
        real32                       Discharge_Temp_Avg;

        [Description("Standard deviation of temperature during battery discharge.")]
        real32                       Discharge_Temp_Std_Dev;

        [Description("Maximum temperature during battery discharge.")]
        sint16                       Discharge_Temp_Max;

        [Description("Minimum temperature during battery discharge.")]
        sint16                       Discharge_Temp_Min;

        [Description("Average current (in mA) during battery discharge.")]
        real32                       Discharge_mA_Avg;

        [Description("Standard deviation of current (in mA) during battery discharge.")]
        real32                       Discharge_mA_Std_Dev;

        [Description("Maximum current (in mA) during battery discharge.")]
        sint32                       Discharge_mA_Max;

        [Description("Minimum current (in mA) during battery discharge.")]
        sint32                       Discharge_mA_Min;

        [Description("Average voltage (in mV) during battery discharge.")]
        real32                       Discharge_mV_Avg;

        [Description("Standard deviation of voltage (in mV) during battery discharge.")]
        real32                       Discharge_mV_Std_Dev;

        [Description("Maximum voltage (in mV) during battery discharge.")]
        sint32                       Discharge_mV_Max;

        [Description("Minimum voltage (in mV) during battery discharge.")]
        sint32                       Discharge_mV_Min;

        [Description("Average power (in W) during battery discharge.")]
        real32                       Discharge_Power_W_Avg;

        [Description("Standard deviation of power (in W) during battery discharge.")]
```

```
        real32                          Discharge_Power_W_Std_Dev;

        [Description("Maximum power (in W) during battery discharge.")]
        sint32                          Discharge_Power_W_Max;

        [Description("Minimum power (in W) during battery discharge.")]
        sint32                          Discharge_Power_W_Min;

        [Description("Percentage of time the power during discharge was between 0 to 5W.")]
        sint16                          Discharge_Power_0_5W_Pct;

        [Description("Percentage of time the power during discharge was between 5 to 10W.")]
        sint16                          Discharge_Power_5_10W_Pct;

        [Description("Percentage of time the power during discharge was between 10 to 15W.")]
        sint16                          Discharge_Power_10_15W_Pct;

        [Description("Percentage of time the power during discharge was between 15 to 20W.")]
        sint16                          Discharge_Power_15_20W_Pct;

        [Description("Percentage of time the power during discharge was between 20 to 25W.")]
        sint16                          Discharge_Power_20_25W_Pct;

        [Description("Percentage of time the power during discharge was between 25 to 30W.")]
        sint16                          Discharge_Power_25_30W_Pct;

        [Description("Percentage of time the power during discharge was between 30 to 40W.")]
        sint16                          Discharge_Power_30_40W_Pct;

        [Description("Percentage of time the power during discharge was between 40 to 50W.")]
        sint16                          Discharge_Power_40_50W_Pct;

        [Description("Percentage of time the power during discharge was between 50 to 60W.")]
        sint16                          Discharge_Power_50_60W_Pct;

        [Description("Percentage of time the power during discharge was more than 60W.")]
        sint16                          Discharge_Power_GT60W_Pct;

        [Description("Total time (in minutes) the battery was in charge state.")]
        real32                          Charge_Time_mins;

        [Description("Number of sessions where the battery got fully charged.")]
// NameChange  sint16                           Charge_Number_Full_Charge_Sessions;
        sint16                          Num_Full_Charge_Sessions;

        [Description("Number of sessions where the battery got partially charged.")]
// NameChange  sint16                           Charge_Number_Partial_Charge_Sessions;
        sint16                          Num_Partial_Charge_Sessions;

        [Description("Average temperature during battery charge.")]
        real32                          Charge_Temp_Avg;

        [Description("Standard deviation of temperature during battery charge.")]
        real32                          Charge_Temp_Std_Dev;

        [Description("Maximum temperature during battery charge.")]
        sint16                          Charge_Temp_Max;

        [Description("Minimum temperature during battery charge.")]
        sint16                          Charge_Temp_Min;

        [Description("Average current (in mA) during battery charge.")]
        real32                          Charge_mA_Avg;

        [Description("Standard deviation of current (in mA) during battery charge.")]
        real32                          Charge_mA_Std_Dev;
```

```
        [Description("Maximum current (in mA) during battery charge.")]
        sint32                  Charge_mA_Max;

        [Description("Minimum current (in mA) during battery charge.")]
        sint32                  Charge_mA_Min;

        [Description("Average voltage (in mV) during battery charge.")]
        real32                  Charge_mV_Avg;

        [Description("Standard deviation of voltage (in mV) during battery charge.")]
        real32                  Charge_mV_Std_Dev;

        [Description("Maximum voltage (in mV) during battery charge.")]
        sint32                  Charge_mV_Max;

        [Description("Minimum voltage (in mV) during battery charge.")]
        sint32                  Charge_mV_Min;

        [Description("Average power (in W) during battery charge when RSOC was less than 60%.")]
// NameChange  real32           Charge_Power_W_RSOC_LE_60_Avg;
        real32                  Charge_Pwr_RSOC_LE_60_Avg;

        [Description("Standard deviation of power (in W) during battery charge when RSOC was less than 60%.")]
// NameChange  real32           Charge_Power_W_RSOC_LE_60_Std_Dev;
        real32                  Charge_Pwr_RSOC_LE_60_StDv;

        [Description("Maximum power (in W) during battery charge when RSOC was less than 60%.")]
// NameChange  sint16           Charge_Power_W_RSOC_LE_60_Max;
        sint16                  Charge_Pwr_RSOC_LE_60_Max;

        [Description("Minimum power (in W) during battery charge when RSOC was less than 60%.")]
// NameChange  sint16           Charge_Power_W_RSOC_LE_60_Min;
        sint16                  Charge_Pwr_RSOC_LE_60_Min;

        [Description("Average power (in W) during battery charge when RSOC was more than 60%.")]
// NameChange  real32           Charge_Power_W_RSOC_LGT_60_Avg;
        real32                  Charge_Pwr_RSOC_LGT_60_Avg;

        [Description("Standard deviation of power (in W) during battery charge when RSOC was more than 60%.")]
// NameChange  real32           Charge_Power_W_RSOC_LGT_60_Std_Dev;
        real32                  Charge_Pwr_RSOC_LGT_60_StDv;

        [Description("Maximum power (in W) during battery charge when RSOC was more than 60%.")]
// NameChange  sint16           Charge_Power_W_RSOC_LGT_60_Max;
        sint16                  Charge_Pwr_RSOC_LGT_60_Max;

        [Description("Minimum power (in W) during battery charge when RSOC was more than 60%.")]
// NameChange  sint16           Charge_Power_W_RSOC_LGT_60_Min;
        sint16                  Charge_Pwr_RSOC_LGT_60_Min;

        [Description("Total time (in minutes) the battery was in dwell state.")]
        real32                  Dwell_Time_mins;

        [Description("Average RSOC level when the battery was in dwell state.")]
        real32                  Dwell_Avg_RSOC_Level;

        [Description("Average temperature during battery dwell state.")]
        real32                  Dwell_Temp_Avg;

        [Description("Standard deviation of temperature during battery dwell state.")]
        real32                  Dwell_Temp_Std_Dev;

        [Description("Maximum temperature during battery dwell state.")]
        sint32                  Dwell_Temp_Max;
```

```
        [Description("Minimum temperature during battery dwell state.")]
        sint32                          Dwell_Temp_Min;
};

/*****************************************************************
 * DPO_HardwareInfoToBattery
 * This class associates DPO_Battery instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[
Association : ToInstance,
Description(" This class associates DPO_Battery instance(s) with an"
" instance of DPO_HardwareInfo."),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToBattery
{
[key]  DPO_HardwareInfo  REF        Antecedent;
[key]  DPO_Battery                  REF        Dependent;
};

/*****************************************************************
 * DPO_NBFan
 * This has the notebook fan information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Notebook fan speed statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_NBFan
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                        HardwareInfoGUID;

        [
         Description("Notebook fan index number starting from 0."),
         Key
        ] sint16                        Index;

        [Description("Location where the fan is present in the system.")]
        string                          Location;

        [Description("Percentage of time fan rpm was non-zero.")]
        sint16                          Fan_Duty_Cycle_Pct;

        [Description("Fan speed when the summary log was generated.")]
        sint32                          RPM;

        [Description("Peak fan speed.")]
        sint32                          Peak_Fan_RPM;

        [Description("Average fan speed.")]
        real32                          Average_Fan_RPM;

        [Description("Percentage of time the fan speed was 0 RPM.")]
        sint16                          RPM_0_Pct;

        [Description("Percentage of time the fan speed was between 0 and 1000 RPMs.")]
        sint16                          RPM_0_1000_Pct;

        [Description("Percentage of time the fan speed was between 1000 and 1700 RPMs.")]
        sint16                          RPM_1000_1700_Pct;

        [Description("Percentage of time the fan speed was between 1700 and 2200 RPMs.")]
```

```
        sint16                          RPM_1700_2200_Pct;

        [Description("Percentage of time the fan speed was between 2200 and 2600 RPMs.")]
        sint16                          RPM_2200_2600_Pct;

        [Description("Percentage of time the fan speed was between 2600 and 2900 RPMs.")]
        sint16                          RPM_2600_2900_Pct;

        [Description("Percentage of time the fan speed was between 2900 and 3100 RPMs.")]
        sint16                          RPM_2900_3100_Pct;

        [Description("Percentage of time the fan speed was between 3100 and 3300 RPMs.")]
        sint16                          RPM_3100_3300_Pct;

        [Description("Percentage of time the fan speed was between 3300 and 3600 RPMs.")]
        sint16                          RPM_3300_3600_Pct;

        [Description("Percentage of time the fan speed was between 3600 and 3900 RPMs.")]
        sint16                          RPM_3600_3900_Pct;

        [Description("Percentage of time the fan speed was between 3900 and 4200 RPMs.")]
        sint16                          RPM_3900_4200_Pct;

        [Description("Percentage of time the fan speed was between 4200 and 4600 RPMs.")]
        sint16                          RPM_4200_4600_Pct;

        [Description("Percentage of time the fan speed was between 4600 and 5100 RPMs.")]
        sint16                          RPM_4600_5100_Pct;

        [Description("Percentage of time the fan speed was between 5100 and 5600 RPMs.")]
        sint16                          RPM_5100_5600_Pct;

        [Description("Percentage of time the fan speed was between 5600 and 6200 RPMs.")]
        sint16                          RPM_5600_6200_Pct;

        [Description("Percentage of time the fan speed was between 6200 and 7000 RPMs.")]
        sint16                          RPM_6200_7000_Pct;

        [Description("Percentage of time the fan speed was more than 7000 RPMs.")]
        sint16                          RPM_GT7000_Pct;
};

/*****************************************************************
 * DPO_HardwareInfoToNBFan
 * This class associates DPO_NBFan instance(s) with an
 * instance of DPO_NBFan.
 *****************************************************************/
[
Association : ToInstance,
Description("This class associates DPO_NBFan instance(s) "
"with an instance of DPO_NBFan"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToNBFan
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_NBFan                           REF        Dependent;
};

/*****************************************************************
 * DPO_DTFan
 * This has the deskop fan information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Desktop fan speed statistics."),
```

```
 Dynamic,Provider("DPOProv") ]
class DPO_DTFan
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                        HardwareInfoGUID;

        [
         Description("Desktop fan index number starting from 0."),
         Key
        ] sint16                        Index;

        [Description("Location where the fan is present in the system.")]
        string                          Location;

        [Description("Percentage of time fan rpm was non-zero.")]
        sint16                          Fan_Duty_Cycle_Pct;

        [Description("Fan speed when the summary log was generated.")]
        sint32                          RPM;

        [Description("Peak fan speed.")]
        sint32                          Peak_Fan_RPM;

        [Description("Average fan speed.")]
        real32                          Average_Fan_RPM;

        [Description("Percentage of time the fan speed was between 0 and 500 RPMs.")]
        sint16                          RPM_0_500_Pct;

        [Description("Percentage of time the fan speed was between 500 and 900 RPMs.")]
        sint16                          RPM_500_900_Pct;

        [Description("Percentage of time the fan speed was between 900 and 1100 RPMs.")]
        sint16                          RPM_900_1100_Pct;

        [Description("Percentage of time the fan speed was between 1100 and 1300 RPMs.")]
        sint16                          RPM_1100_1300_Pct;

        [Description("Percentage of time the fan speed was between 1300 and 1600 RPMs.")]
        sint16                          RPM_1300_1600_Pct;

        [Description("Percentage of time the fan speed was between 1600 and 1900 RPMs.")]
        sint16                          RPM_1600_1900_Pct;

        [Description("Percentage of time the fan speed was between 1900 and 2300 RPMs.")]
        sint16                          RPM_1900_2300_Pct;

        [Description("Percentage of time the fan speed was between 2300 and 2700 RPMs.")]
        sint16                          RPM_2300_2700_Pct;

        [Description("Percentage of time the fan speed was between 2700 and 3100 RPMs.")]
        sint16                          RPM_2700_3100_Pct;

        [Description("Percentage of time the fan speed was between 3100 and 3500 RPMs.")]
        sint16                          RPM_3100_3500_Pct;

        [Description("Percentage of time the fan speed was between 3500 and 4000 RPMs.")]
        sint16                          RPM_3500_4000_Pct;

        [Description("Percentage of time the fan speed was between 4000 and 4500 RPMs.")]
        sint16                          RPM_4000_4500_Pct;

        [Description("Percentage of time the fan speed was between 4500 and 5000 RPMs.")]
        sint16                          RPM_4500_5000_Pct;
```

```
        [Description("Percentage of time the fan speed was between 5000 and 5500 RPMs.")]
        sint16                          RPM_5000_5500_Pct;

        [Description("Percentage of time the fan speed was between 5500 and 6000 RPMs.")]
        sint16                          RPM_5500_6000_Pct;

        [Description("Percentage of time the fan speed was more than 6000 RPMs.")]
        sint16                          RPM_GT6000_Pct;
};

/*****************************************************************
 * DPO_HardwareInfoToDTFan
 * This class associates DPO_DTFan instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_DTFan instance(s) with "
" an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToDTFan
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_DTFan                           REF         Dependent;
};

/*****************************************************************
 * DPO_Thermistor
 * This has the thermal information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Thermal data from the hardware or BIOS."),
 Dynamic,Provider("DPOProv") ]
class DPO_Thermistor
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                        HardwareInfoGUID;

        [
         Description("Thermistor index number starting from 0."),
         Key
        ] sint16                        Index;

        [Description("Thermistor location eg CPU, Memory etc.")]
        string                          Location;

        [Description("Temperature read from the thermistor when the summary log was generated.")]
        sint16                          Temp;

        [Description("Maximum temperature read from the thermistor.")]
        sint16                          Peak_Temp;

        [Description("Average temperature read from the thermistor.")]
        real32                          Avg_Temp;

        [Description("Minimum temperature read from the thermistor.")]
        sint16                          Min_Temp;

        [Description("Standard deviation of temperature read from the thermistor.")]
        real32                          Std_Dev_Temp;

        [Description("Percentage of time the temperature read was between 0 to 30C.")]
```

```
        sint16                          Temp_0_30C_Pct;

        [Description("Percentage of time the temperature read was between 30 to 40C.")]
        sint16                          Temp_30_40C_Pct;

        [Description("Percentage of time the temperature read was between 40 to 50C.")]
        sint16                          Temp_40_50C_Pct;

        [Description("Percentage of time the temperature read was between 50 to 60C.")]
        sint16                          Temp_50_60C_Pct;

        [Description("Percentage of time the temperature read was between 60 to 70C.")]
        sint16                          Temp_60_70C_Pct;

        [Description("Percentage of time the temperature read was between 70 to 80C.")]
        sint16                          Temp_70_80C_Pct;

        [Description("Percentage of time the temperature read was between 80 to 90C.")]
        sint16                          Temp_80_90C_Pct;

        [Description("Percentage of time the temperature read was between 90 to 100C.")]
        sint16                          Temp_90_100C_Pct;

        [Description("Percentage of time the temperature read was more than 100C.")]
        sint16                          Temp_GT100C_Pct;
};

/*****************************************************************
 * DPO_HardwareInfoToThermistor
 * This class associates DPO_Thermistor instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_Thermistor instance(s) "
" with an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToThermistor
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_Thermistor              REF         Dependent;
};

/*****************************************************************
 * DPO_Logical_Processor
 * This has the logical processor information from a summary log.
 * There may be multiple instances of this class for each summary
 * file.
 *****************************************************************/
[Description("Logical processors statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_Logical_Processor
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Index of logical processor starting from 0."),
         Key
        ]
        sint16                          Index;
```

```
        [Description("Percentage of time the logical processor was used, ie. when the CPU consumption was non-zero.")]
        sint16                          Used_Pct;

        [Description("Average processor utilization.")]
        sint16                          Avg_Utilization_Pct;
};

/*****************************************************************
 * DPO_HardwareInfoToLogical_Processor
 * This class associates DPO_Logical_Processor instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_Logical_Processor "
" instance(s) with an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToLogical_Processor
{
  [key] DPO_HardwareInfo            REF     Antecedent;
  [key] DPO_Logical_Processor       REF     Dependent;
};

/*****************************************************************
 * DPO_Disk
 * This has the physical disk information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Information for each physical disk found on the system."),
 Dynamic,Provider("DPOProv") ]
class DPO_Disk
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Index of the physical disk starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Name of the disk.")]
        string                          Name;

        [Description("Disk model number.")]
        string                          Make_Model;

        [Description("Total disk size in MBs.")]
        sint32                          Size_MB;

        [Description("Disk ePPID.")]
        string                          ePPID;

        [Description("Unique ID assigned to this disk instance.")]
        string                          DiskGUID;

        [Description("Percentage of time the disk was busy in read operations.")]
        sint16                          Read_Time_Pct;

        [Description("Percentage of time the disk was busy in write operations.")]
        sint16                          Write_Time_Pct;
```

```
        [Description("Percentage of time the disk was idle.")]
        sint16                          Idle_Time_Pct;

        [Description("Total data read from the disk in MB.")]
        sint32                          Bytes_Read_MB;

        [Description("Total data written to the disk in MB.")]
        sint32                          Bytes_Write_MB;
};

/*****************************************************************
 * DPO_HardwareInfoToDisk
 * This class associates DPO_Disk instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_Disk instance(s) with "
" an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToDisk
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_Disk                            REF         Dependent;
};

/*****************************************************************
 * DPO_Partition
 * This has the logical partition information from a summary log.
 * There may be multiple instances of this class for each summary
 * file.
 *****************************************************************/
[Description("Information for each partition found on a disk."),
 Dynamic,Provider("DPOProv") ]
class DPO_Partition
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Unique ID assigned to the physical disk instance to which this partition belongs."),
         Key
        ]
        string                          DiskGUID;

        [
         Description("Parition index number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Partition name, eg C:.")]
        string                          Name;

        [Description("Total size of the partition in MBs.")]
        sint32                          Size_MB;
};

/*****************************************************************
 * DPO_DiskToPartition
 * This class associates DPO_Partition instance(s) with an
 * instance of DPO_Disk.
```

```
 ************************************************************/
[Association : ToInstance,
Description(" This class associates DPO_Partition instance(s) "
" with an instance of DPO_Disk"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_DiskToPartition
{
  [key] DPO_Disk                        REF        Antecedent;
  [key] DPO_Partition          REF        Dependent;
};

/************************************************************
 * DPO_LanAdapter
 * This has the lan adapter information from a summary log. There
 * may be multiple instances of this class for each summary file.
 ************************************************************/
[Description("LAN adapter information and statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_LanAdapter
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("LAN adapter index number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("LAN adapter name.")]
        string                          Name;

        [Description("LAN adapter's MAC address.")]
        string                          MAC;

        [Description("Percentage of time the adapter was busy when the system was on AC.")]
        sint16                          ActivityAC_Pct;

        [Description("Percentage of time the adapter was busy when the systen was on battery.")]
        sint16                          ActivityDC_Pct;
};

/************************************************************
 * DPO_HardwareInfoToLanAdapter
 * This class associates DPO_LanAdapter instance(s) with an
 * instance of DPO_HardwareInfo.
 ************************************************************/
[Association : ToInstance,
Description("This class associates DPO_LanAdapter instance(s) "
" with an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToLanAdapter
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_LanAdapter          REF        Dependent;
};

/************************************************************
 * DPO_WlanAdapter
```

```
 * This has the wlan adapter information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Wireless LAN adapter information and statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_WlanAdapter
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Wireless LAN adapter index number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Wireless LAN adapter name.")]
        string                          Name;

        [Description("Wireless LAN adapter's MAC address.")]
        string                          MAC;

        [Description("Percentage of time the radio was off when the system was on AC.")]
        sint16                          WlanRadioOffAC_Pct;

        [Description("Percentage of time the WLAN adapter was connected when the system was on AC.")]
        sint16                          WlanConnectedAC_Pct;

        [Description("Percentage of time the adapter was not connected when the system was on AC.")]
        sint16                          WlanDisconnectedAC_Pct;

        [Description("Percentage of time the radio was off when the system was on battery.")]
        sint16                          WlanRadioOffDC_Pct;

        [Description("Percentage of time the WLAN adapter was connected when the system was on battery.")]
        sint16                          WlanConnectedDC_Pct;

        [Description("Percentage of time the adapter was not connected when the system was on battery.")]
        sint16                          WlanDisconnectedDC_Pct;
};

/*****************************************************************
 * DPO_HardwareInfoToWlanAdapter
 * This class associates DPO_WlanAdapter instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_WlanAdapter instance(s) "
" with an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToWlanAdapter
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_WlanAdapter             REF         Dependent;
};

/*****************************************************************
 * DPO_Smart
 * This has the SMART information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
```

```
[Description("SMART data from all disks (if reported by the disk)."),
 Dynamic,Provider("DPOProv") ]
class DPO_Smart
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Smart data index number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Name eg, SMART0.")]
        string                          Name;

        [Description("Disk Model number.")]
        string                          Model;

        [Description("Average disk temperature read using SMART.")]
        real32                          Temp_Avg;

        [Description("Standard deviation of disk temperature read using SMART.")]
        real32                          Temp_Std_Dev;

        [Description("Minimum disk temperature read using SMART.")]
        sint16                          Temp_Min;

        [Description("Maximum disk temperature read using SMART.")]
        sint16                          Temp_Max;

        [Description("Percentage of time disk temperature read using SMART was between 0 to 30C.")]
        sint16                          Temp_0_30_Pct;

        [Description("Percentage of time disk temperature read using SMART was between 30 to 40C.")]
        sint16                          Temp_30_40_Pct;

        [Description("Percentage of time disk temperature read using SMART was between 40 to 50C.")]
        sint16                          Temp_40_50_Pct;

        [Description("Percentage of time disk temperature read using SMART was between 50 to 60C.")]
        sint16                          Temp_50_60_Pct;

        [Description("Percentage of time disk temperature read using SMART was between 60 to 70C.")]
        sint16                          Temp_60_70_Pct;

        [Description("Percentage of time disk temperature read using SMART was between 70 to 80C.")]
        sint16                          Temp_70_80_Pct;

        [Description("Percentage of time disk temperature read using SMART was more than 80C.")]
        sint16                          Temp_GT_80_Pct;

        [Description("Shock events.")]
        sint32                          Shock_Events;

        [Description("Shock events (normalized value).")]
        uint8                           Shock_Events_Normalized;

        [Description("Shock events (worst value).")]
        uint8                           Shock_Events_Worst;

        [Description("Shock events (threshold value).")]
        uint8                           Shock_Events_Threshold;
```

```
[Description("Total blocks read from the disk.")]
sint64                          Blks_Read;

[Description("Total blocks read from the disk (normalized value).")]
uint8                           Blks_Read_Normalized;

[Description("Total blocks read from the disk (worst value).")]
uint8                           Blks_Read_Worst;

[Description("Total blocks read from the disk (threshold value).")]
uint8                           Blks_Read_Threshold;

[Description("Total blocks written to the disk.")]
sint64                          Blks_Written;

[Description("Total blocks written to the disk (normalized value).")]
uint8                           Blks_Written_Normalized;

[Description("Total blocks written to the disk (worst value).")]
uint8                           Blks_Written_Worst;

[Description("Total blocks written to the disk (threshold value).")]
uint8                           Blks_Written_Threshold;

[Description("Start stop count.")]
sint64                          Start_Stop_Count;

[Description("Start stop count (normalized value).")]
uint8                           Start_Stop_Count_Normalized;

[Description("Start stop count (worst value).")]
uint8                           Start_Stop_Count_Worst;

[Description("Start stop count (threshold value).")]
uint8                           Start_Stop_Count_Threshold;

[Description("Load unload cycle count.")]
sint64                          Load_Unload_Cycle_Count;

[Description("Load unload cycle count (normalized value).")]
uint8                           Load_Unload_Cycle_Count_Normalized;

[Description("Load unload cycle count (worst value).")]
uint8                           Load_Unload_Cycle_Count_Worst;

[Description("Load unload cycle count (threshold value).")]
uint8                           Load_Unload_Cycle_Count_Threshold;

[Description("Total power on hours.")]
sint64                          Power_On_Hours;

[Description("Total power on hours (normalized value).")]
uint8                           Power_On_Hours_Normalized;

[Description("Total power on hours (worst value).")]
uint8                           Power_On_Hours_Worst;

[Description("Total power on hours (threshold value).")]
uint8                           Power_On_Hours_Threshold;

[Description("Realloc sector count.")]
sint64                          ReAlloc_Sector_Count;

[Description("Realloc sector count (normalized value).")]
uint8                           ReAlloc_Sector_Count_Normalized;
```

```
[Description("Realloc sector count (worst value).")]
uint8                           ReAlloc_Sector_Count_Worst;

[Description("Realloc sector count (threshold value).")]
uint8                           ReAlloc_Sector_Count_Threshold;

[Description("Head flying hours.")]
sint64                          Head_Flying_Hours;

[Description("Head flying hours (normalized value).")]
uint8                           Head_Flying_Hours_Normalized;

[Description("Head flying hours (worst value).")]
uint8                           Head_Flying_Hours_Worst;

[Description("Head flying hours (threshold value).")]
uint8                           Head_Flying_Hours_Threshold;

[Description("Raw read error rate.")]
sint64                          Raw_Read_Error_Rate;

[Description("Raw read error rate (normalized value).")]
uint8                           Raw_Read_Error_Rate_Normalized;

[Description("Raw read error rate (worst value).")]
uint8                           Raw_Read_Error_Rate_Worst;

[Description("Raw read error rate (threshold value).")]
uint8                           Raw_Read_Error_Rate_Threshold;

[Description("Spin up time.")]
sint64                          Spin_Up_Time;

[Description("Spin up time (normalized value).")]
uint8                           Spin_Up_Time_Normalized;

[Description("Spin up time (worst value).")]
uint8                           Spin_Up_Time_Worst;

[Description("Spin up time (threshold value).")]
uint8                           Spin_Up_Time_Threshold;

[Description("Free fall count.")]
sint64                          Free_Fall_Count;

[Description("Free fall count (normalized value).")]
uint8                           Free_Fall_Count_Normalized;

[Description("Free fall count (worst value).")]
uint8                           Free_Fall_Count_Worst;

[Description("Free fall count (threshold value).")]
uint8                           Free_Fall_Count_Threshold;

[Description("Power cycle count.")]
sint64                          Power_Cycle_Count;

[Description("Power cycle count (normalized value).")]
uint8                           Power_Cycle_Count_Normalized;

[Description("Power cycle count (worst value).")]
uint8                           Power_Cycle_Count_Worst;

[Description("Power cycle count (threshold value).")]
uint8                           Power_Cycle_Count_Threshold;
```

```
[Description("Program fail count.")]
sint64                          Program_Fail_Count;

[Description("Program fail count (normalized value).")]
uint8                           Program_Fail_Count_Normalized;

[Description("Program fail count (worst value).")]
uint8                           Program_Fail_Count_Worst;

[Description("Program fail count (threshold value).")]
uint8                           Program_Fail_Count_Threshold;

[Description("Erase fail count.")]
sint64                          Erase_Fail_Count;

[Description("Erase fail count (normalized value).")]
uint8                           Erase_Fail_Count_Normalized;

[Description("Erase fail count (worst value).")]
uint8                           Erase_Fail_Count_Worst;

[Description("Erase fail count (threshold value).")]
uint8                           Erase_Fail_Count_Threshold;

[Description("Wear leveling count.")]
sint64                          Wear_Leveling_Count;

[Description("Wear leveling count (normalized value).")]
uint8                           Wear_Leveling_Count_Normalized;

[Description("Wear leveling count (worst value).")]
uint8                           Wear_Leveling_Count_Worst;

[Description("Wear leveling count (threshold value).")]
uint8                           Wear_Leveling_Count_Threshold;

[Description("User reserved block count.")]
sint64                          User_Rsvd_Block_Count;

[Description("User reserved block count (normalized value).")]
uint8                           User_Rsvd_Block_Count_Normalized;

[Description("User reserved block count (worst value).")]
uint8                           User_Rsvd_Block_Count_Worst;

[Description("User reserved block count (threshold value).")]
uint8                           User_Rsvd_Block_Count_Threshold;

[Description("User reserved block count (SSD Total).")]
sint64                          User_Rsvd_Block_Count_Total;

[Description("User reserved block count (SSD Total) (normalized value).")]
uint8                           User_Rsvd_Block_Count_Total_Normalized;

[Description("User reserved block count (SSD Total) (worst value).")]
uint8                           User_Rsvd_Block_Count_Total_Worst;

[Description("User reserved block count (SSD Total) (threshold value).")]
uint8                           User_Rsvd_Block_Count_Total_Threshold;

[Description("Unused reserved block count.")]
sint64                          Unused_Rsvd_Block_Count;

[Description("Unused reserved block count (normalized value).")]
uint8                           Unused_Rsvd_Block_Count_Normalized;
```

```
        [Description("Unused reserved block count (worst value).")]
        uint8                           Unused_Rsvd_Block_Count_Worst;

        [Description("Unused reserved block count (threshold value).")]
        uint8                           Unused_Rsvd_Block_Count_Threshold;

        [Description("Program fail count (SSD Total).")]
        sint64                          Program_Fail_Count_Total;

        [Description("Program fail count (SSD Total) (normalized value).")]
        uint8                           Program_Fail_Count_Total_Normalized;

        [Description("Program fail count (SSD Total) (worst value).")]
        uint8                           Program_Fail_Count_Total_Worst;

        [Description("Program fail count (SSD Total) (threshold value).")]
        uint8                           Program_Fail_Count_Total_Threshold;

        [Description("Erase fail count (SSD Total).")]
        sint64                          Erase_Fail_Count_Total;

        [Description("Erase fail count (SSD Total) (normalized value).")]
        uint8                           Erase_Fail_Count_Total_Normalized;

        [Description("Erase fail count (SSD Total) (worst value).")]
        uint8                           Erase_Fail_Count_Total_Worst;

        [Description("Erase fail count (SSD Total) (threshold value).")]
        uint8                           Erase_Fail_Count_Total_Threshold;

        [Description("Uncorrectable error count.")]
        sint64                          Uncorrectable_Error_Count;

        [Description("Uncorrectable error count (normalized value).")]
        uint8                           Uncorrectable_Error_Count_Normalized;

        [Description("Uncorrectable error count (worst value).")]
        uint8                           Uncorrectable_Error_Count_Worst;

        [Description("Uncorrectable error count (threshold value).")]
        uint8                           Uncorrectable_Error_Count_Threshold;

        [Description("ECC rate.")]
        sint64                          Ecc_Rate;

        [Description("ECC rate (normalized value).")]
        uint8                           Ecc_Rate_Normalized;

        [Description("ECC rate (worst value).")]
        uint8                           Ecc_Rate_Worst;

        [Description("ECC rate (threshold value).")]
        uint8                           Ecc_Rate_Threshold;
};

/*************************************************************
 * DPO_HardwareInfoToSmart
 * This class associates DPO_Smart instance(s) with an
 * instance of DPO_HardwareInfo.
 *************************************************************/
[Association : ToInstance,
Description("This class associates DPO_Smart instance(s) with"
" an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
```

```
]
class DPO_HardwareInfoToSmart
{
  [key] DPO_HardwareInfo REF          Antecedent;
  [key] DPO_Smart                              REF          Dependent;
};

/*****************************************************************
 * DPO_DIMM
 * This has the DIMM information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("DIMM information for all DIMMs reported by the BIOS."),
 Dynamic,Provider("DPOProv") ]
class DPO_DIMM
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                                HardwareInfoGUID;

        [
         Description("DIMM index number starting from 0."),
         Key
        ]
        sint16                                Index;

        [Description("DIMM name.")]
        string                                Name;

        [Description("DIMM manufacturer's name.")]
        string                                Manufacturer;

        [Description("DIMM part number.")]
        string                                Part;

        [Description("DIMM location.")]
        string                                Location;

        [Description("DIMM serial number.")]
        string                                Serial;
};

/*****************************************************************
 * DPO_HardwareInfoToDIMM
 * This class associates DPO_DIMM instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_DIMM instance(s) with "
"an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToDIMM
{
  [key] DPO_HardwareInfo REF          Antecedent;
  [key] DPO_DIMM                               REF          Dependent;
};

/*****************************************************************
 * DPO_Logical_Drive_Info_New
 * This has the new logical drive information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
```

```
[Description("Logical drive information for all logical drives found on the system."),
 Dynamic,Provider("DPOProv") ]
class DPO_Logical_Drive_Info_New
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Logical drive index number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Logical drive name, eg. C:.")]
        string                          Name;

        [Description("Total logical drive size in MBs.")]
        sint64                          Size_MB;

        [Description("Total free space on the logical drive in MBs.")]
        sint64                          Freespace_MB;
};

/*****************************************************************
 * DPO_HardwareInfoToLogicalDriveInfoNew
 * This class associates DPO_Logical_Drive_Info_New instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_Logical_Drive_Info_New instance(s) with "
"an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToLogicalDriveInfoNew
{
  [key] DPO_HardwareInfo                        REF         Antecedent;
  [key] DPO_Logical_Drive_Info_NewREF           Dependent;
};



/*****************************************************************
 * DPO_CrashInfo
 * This has the system bug check information from a summary
 * log. There may be multiple instances of this class for
 * each summary file.
 *****************************************************************/
[Description("System crash information from the summary log file. This information is extracted from"
" Windows Event Log"),
 Dynamic,Provider("DPOProv") ]
class DPO_CrashInfo
{
        [
        Description("Unique ID from the summary file."),
        Key
        ]
        string   HardwareInfoGUID;

        [
        Description("Index number, starting from 0."),
        Key
        ]
```

```
        sint16   Index;

        [Description("Local Time stamp (with time zone) of the date/time the crash was generated.")]
        string   BugCheck_Time;

        [Description("Information string from Windows Event Log.")]
        string   BugCheck_String;

        [Description("MiniDump File Name.")]
        string   Minidump_FileName;

        [Description("MiniDump File Data Length")]
        uint32   Minidump_DataLen;

        [Description("MiniDump File Binary Data")]
        uint8   Minidump_Data [];

        [Description("Bug check stack frame 1")]
        string   BugCheck_Stack1;

        [Description("Bug check stack frame 2")]
        string   BugCheck_Stack2;

        [Description("Bug check stack frame 3")]
        string   BugCheck_Stack3;

        [Description("Bug check stack frame 4")]
        string   BugCheck_Stack4;

        [Description("Bug check stack frame 5")]
        string   BugCheck_Stack5;
};


/*****************************************************************
 * DPO_HardwareInfoToCrashInfo
 * This class associates DPO_CrashInfo instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_CrashInfo instance(s) with "
"an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToCrashInfo
{
  [key] DPO_HardwareInfo                    REF         Antecedent;
  [key] DPO_CrashInfo                                   REF         Dependent;
};

/*****************************************************************
 * DPO_FreeFall
 * This has Free fall information from a summary
 * log. Right now, there is only one instance of this class for
 * each summary file but that may change in the future.
 *****************************************************************/

[Description("Free fall information from the summary log file."),
 Dynamic,Provider("DPOProv") ]
class DPO_FreeFall
{
        [
        Description("Unique ID from the summary file."),
        Key
        ]
```

```
        string   HardwareInfoGUID;

        [
        Description("Number of times free fall condition was detected since last summary file was generated.")
        ]
        sint16       FreeFallCount;
};



/*****************************************************************
 * DPO_HardwareInfoToFreeFall
 * This class associates DPO_FreeFall instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_FreeFall instance(s) with "
"an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToFreeFall
{
  [key] DPO_HardwareInfo                    REF         Antecedent;
  [key] DPO_FreeFall                                    REF         Dependent;
};

/*****************************************************************
 * DPO_Cable
 * This has the cable log information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Cable logs: List of all cables attached, required but not connected in the system."),
 Dynamic,Provider("DPOProv") ]
class DPO_Cable
{
        [
         Description("Unique ID from the summary file."),
         Key
        ] string                    HardwareInfoGUID;

        [
         Description("Cable index number, starting from 0."),
         Key
        ] sint16                            Index;

        [Description("Name of cable.")]
        string                              Name;

        [Description("Cable's connection status.")]
        string                              Status;
};

/*****************************************************************
 * DPO_HardwareInfoToCableLogs
 * This class associates DPO_HardwareInfoToCable
 * instance(s) with an instance of DPO_HardwareInfo.
 *****************************************************************/
[
Association : ToInstance,
Description("This class associates DPO_HardwareInfoToCable"
" instance(s) with an instance of DPO_HardwareInfo."),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToCable
```

```
{
  [key] DPO_HardwareInfo                REF         Antecedent;
  [key] DPO_Cable             REF         Dependent;
};

/*****************************************************************
 * DPO_CableChangeHistory
 * This has the cable change history information from a summary log.
 * There may be multiple instances of this class for each summary
 * file.
 *****************************************************************/
[Description("Information for status change for a cable."),
 Dynamic,Provider("DPOProv") ]
class DPO_CableChangeHistory
{
        [Description("Name of cable.")]
        string                          Name;

        [Description("Timestamp when the change in cable status was noted.")]
        string                          Timestamp;

        [Description("Cable's connection status.")]
        string                          Status;
};

/*****************************************************************
 * DPO_CableToCableChangeHistory
 * This class associates DPO_CableChangeHistory instance(s) with an
 * instance of DPO_Cable.
 *****************************************************************/
[Association : ToInstance,
Description(" This class associates DPO_CableChangeHistory instance(s) "
" with an instance of DPO_Cable"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_CableToCableChangeHistory
{
  [key] DPO_Cable                                       REF         Antecedent;
  [key] DPO_CableChangeHistory      REF         Dependent;
};

/*****************************************************************
 * DPO_BTModule
 * This has the bluetooth module information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Bluetooth module information and statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_BTModule
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Bluetooth module index number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Bluetooth module name.")]
        string                          Name;
```

```
        [Description("Bluetooth modoule's address.")]
        string                          Address;

        [Description("Percentage of time the radio was on when the system was on AC.")]
        sint16                          BTRadioOnAC_Pct;

        [Description("Percentage of time the bluetooth module was connected when the system was on AC.")]
        sint16                          BTConnectedAC_Pct;

        [Description("Percentage of time the module was not connected when the system was on AC.")]
        sint16                          BTDisconnectedAC_Pct;

        [Description("Percentage of time the radio was on when the system was on battery.")]
        sint16                          BTRadioOnDC_Pct;

        [Description("Percentage of time the bluetooth module was connected when the system was on battery.")]
        sint16                          BTConnectedDC_Pct;

        [Description("Percentage of time the module was not connected when the system was on battery.")]
        sint16                          BTDisconnectedDC_Pct;
};

/*****************************************************************
 * DPO_HardwareInfoToBTModule
 * This class associates DPO_BTModule instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_BTModule instance(s) "
" with an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToBTModule
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_BTModule                REF         Dependent;
};



/*****************************************************************
 * DPO_IntelPerf
 * This has the Intel performance information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Intel performance information and statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_IntelPerf
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("Processor number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Minimum active relative frequency of the processor.")]
        real32                          Min_ActiveRelativeFreq;

        [Description("Maximum active relative frequency of the processor.")]
```

```
        real32                          Max_ActiveRelativeFreq;

        [Description("Averaye active relative frequency of the processor.")]
        real32                          Avg_ActiveRelativeFreq;

        [Description("Percentage of time the processor was in turbo mode when the system was on AC.")]
        real32                          TurboResidencyACPct;

        [Description("Percentage of time the processor was in turbo mode when the system was on battery.")]
        real32                          TurboResidencyDCPct;
};

/*****************************************************************
 * DPO_HardwareInfoToIntelPerf
 * This class associates DPO_IntelPerf instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_IntelPerf instance(s) "
" with an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToIntelPerf
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_IntelPerf               REF        Dependent;
};

/*****************************************************************
 * DPO_Graphics
 * This has the graphics information from a summary log. There
 * may be multiple instances of this class for each summary file.
 *****************************************************************/
[Description("Graphics performance information and statistics."),
 Dynamic,Provider("DPOProv") ]
class DPO_Graphics
{
        [
         Description("Unique ID from the summary file."),
         Key
        ]
        string                          HardwareInfoGUID;

        [
         Description("GPU number starting from 0."),
         Key
        ]
        sint16                          Index;

        [Description("Minumum GPU utilization.")]
        sint16                          Min_GpuUtilization;

        [Description("Maximum GPU utilization.")]
        sint16                          Max_GpuUtilization;

        [Description("Average GPU utilization.")]
        real32                          Avg_GpuUtilization;

        [Description("Percentage of time GPU was at 0% utilization.")]
        real32                          GpuUtilization_0_Pct;

        [Description("Minumum graphics memory utilization.")]
        sint16                          Min_MemUtilization;

        [Description("Maximum graphics memory utilization.")]
```

```
        sint16                  Max_MemUtilization;

        [Description("Average graphics mempry utilization.")]
        real32                  Avg_MemUtilization;

        [Description("Percentage of time graphics memory was at 0% utilization.")]
        real32                  MemUtilization_0_Pct;

        [Description("Minumum graphics engine utilization.")]
        sint16                  Min_EngineUtilization;

        [Description("Maximum graphics engine utilization.")]
        sint16                  Max_EngineUtilization;

        [Description("Average graphics engine utilization.")]
        real32                  Avg_EngineUtilization;

        [Description("Percentage of time graphics engine was at 0% utilization.")]
        real32                  EngineUtilization_0_Pct;

        [Description("Minumum graphics bus utilization.")]
        sint16                  Min_BusUtilization;

        [Description("Maximum graphics bus utilization.")]
        sint16                  Max_BusUtilization;

        [Description("Average graphics bus utilization.")]
        real32                  Avg_BusUtilization;

        [Description("Percentage of time graphics bus was at 0% utilization.")]
        real32                  BusUtilization_0_Pct;

        [Description("Minumum graphics fan speed. The fan speed is reported in percentage.")]
        sint16                  Min_FanSpeedPct;

        [Description("Maximum graphics fan speed. The fan speed is reported in percentage.")]
        sint16                  Max_FanSpeedPct;

        [Description("Average graphics fan speed. The fan speed is reported in percentage.")]
        real32                  Avg_FanSpeedPct;

        [Description("Percentage of time graphics fan was at 0% speed.")]
        real32                  FanSpeedPct_0_Pct;

        [Description("Minumum GPU temperature.")]
        sint16                  Min_Temperature;

        [Description("Maximum GPU temperature.")]
        sint16                  Max_Temperature;

        [Description("Average GPU temperature.")]
        real32                  Avg_Temperature;
};

/*****************************************************************
 * DPO_HardwareInfoToGraphics
 * This class associates DPO_Graphics instance(s) with an
 * instance of DPO_HardwareInfo.
 *****************************************************************/
[Association : ToInstance,
Description("This class associates DPO_Graphics instance(s) "
" with an instance of DPO_HardwareInfo"),
dynamic:ToInstance,
PROVIDER("DPOProv"):ToInstance
]
class DPO_HardwareInfoToGraphics
```

```
{
  [key] DPO_HardwareInfo REF        Antecedent;
  [key] DPO_Graphics                REF        Dependent;
};


/*
Current DPO version

Features Enabled/Disabled (e.g.GUI control listed above)

Time of last Check for Profiles



Time of last System Update

Time of last Check for Updates

Profile trigger history (time, profile, policy)
*/

/*****************************************************************
 * DPO_Info
 *****************************************************************/
[Description("DPO Info"),
 Dynamic,Provider("DPOProv") ]
class DPO_Info
{
        [
         Description("Product version"),
         key
        ]
        string                          ProductVersion;

        /*
        [
         Description("Features enabled")
        ]
        int
        */

        [
         Description("Date/Time of last check for system updates")
        ]
        string                          LastCheckForUpdateTime;

        [
         Description("Date/Time of last system update")
        ]
        string                          LastSystemUpdateTime;

        [
         Description("Date/Time of last check for updated profiles")
        ]
        string                          LastCheckForProfiles;
};


/*****************************************************************
 * DPO_TriggeredProfiles
 *****************************************************************/
[Description("DPO Profiles that have triggered"),
 Dynamic,Provider("DPOProv") ]
class DPO_TriggeredProfiles
{
```

```
        [
         Description("Unique ID of profile"),
         Key
        ]
        string                          ProfileGUID;

        [
         Description("Name of profile")
        ]
        string                          ProfileName;

        [
         Description("Unique ID of policy that triggered"),
         Key
        ]
        string                          PolicyGUID;

        [
         Description("Name of policy that triggered")
        ]
        string                          PolicyName;

        [
         Description("Date/Time of trigger"),
         key
        ]
        string                  TriggeredAt;

};

/*****************************************************************
 * DPO_Profiles
 *****************************************************************/
[Description("DPO Profiles"),
 Dynamic,Provider("DPOProv") ]
class DPO_Profiles
{
        [
         Description("Unique ID"),
         Key
        ]
        string                          ProfileGUID;

        [
         Description("Name")
        ]
        string                          ProfileName;

        [
         Description("Active")
        ]
        string                                  Active;
};


/*****************************************************************
 * DPO_SmartAlerts
 *****************************************************************/
[Description("DPO Smart Alerts"),
 Dynamic,Provider("DPOProv") ]
class DPO_SmartAlerts
{
        [
         Description("Unique ID of alert"),
         Key
        ]
```

```
        string                          AlertGUID;

        [
         Description("Alert Message")
        ]
        string                          AlertMessage;

        [
         Description("Alert Description"),
        ]
        string                          AlertDescr;

        [
         Description("Guidance"),
        ]
        string                          AlertGuidance;

        [
         Description("Local date/time of alert"),
        ]
        string                  AlertGeneratedAt;

};
/*****************************************************************
 * Creat an instance of the provider
// Setting the HostingModel to Decoupled:Com registers the provider as a decoupled com provider,
// lowers RPC_C_IMP_LEVEL_IMPERSONATE and RPC_C_IMP_LEVEL_DELEGATE impersonation levels to
// RPC_C_IMP_LEVEL_IDENTIFY before calling into provider:

// Setting the HostingModel to Decoupled:Com:FoldIdentity(FALSE} allows original client
// impersonation level through to provider.
// This lets a decoupled provider impersonate the client and hence
// act in the role of that client. This poses a potential security risk for the client
// if the decoupled provider security identity has less rights than the original cliient.
// Use a strong security descriptor when using this option:

 *****************************************************************/


instance of __Win32Provider as $P
{
        Clsid = "{C4ABD5F1-1260-4192-BF0B-11909C172043}";

        Name = "DPOProv";
        HostingModel = "NetworkServiceHost";

};

instance of __InstanceProviderRegistration
{
    Provider = $P;
    SupportsGet = TRUE;
    SupportsPut = FALSE;
    SupportsDelete = FALSE;
    SupportsEnumeration = TRUE;

    // we want WMI to do query parsing
    QuerySupportLevels = NULL;
};


instance of __MethodProviderRegistration
{
    Provider = $P;
};
```