Data Protector Internal Database purge best practices

Commands that purge obsolete data from HP Data Protector Software Internal Database, helping to maintain the Internal Database in good condition

Technical white paper

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Introduction

Growing volumes of backup data can significantly load the Data Protector (DP) Internal Database (IDB). Regular IDB maintenance to purge obsolete data can prevent size related problems.

Purges remove obsolete data from the database, making space available within the database. The space created by the purges can be used by new DP sessions, delaying the requirement for the IDB to be extended.

This document presents some Data Protector commands that can help keep your IDB healthy.

This white paper is complementary to the white paper **HP Data Protector software cell manager planning and sizing**. Please also follow the recommendations therein to facilitate reliable Data Protector operation.

This White Paper can be found at: http://www.hp.com/go/dataprotector → Support Matrices → HP Data Protector V6.1x Software

Scope

This document covers Cell Managers on HP-UX or Windows®, but the principals apply to Cell Managers on other platforms as well. This document covers DP versions 6.0, 6.1 and 6.11.

Note:
It is not intended to issue any new General Release patches for DP 6.1. If using DP 6.1 HP recommends you upgrade to version 6.11.

Three step guide to use this white paper

Note:
Before running any of the commands outlined in this document HP recommends you make a successful backup of the DP IDB.

Step One:
How to identify if a DP IDB needs a filenames purge?

Step Two:
Automated purging done by the Daily Maintenance and making sure these tasks are taking place.

Step Three:
Manual IDB purge operations.

How to identify if a DP IDB needs filenames purging?

There are two ways to identify if a DP IDB needs filename purging:

Automated: Part of the daily health check combined with the DP Reporting feature.

Manual: Using DP Command line interface (CLI) or running preconfigured IDB reports.

Automated discovery

By default, Data Protector checks the condition of the IDB once a day as a part of the daily health check mechanism. The start time of the check is defined by the global file parameter DailyCheckTime.

DailyCheckTime=HH:MM

default: 12:30

This option is used for starting daily checks at first

omnitrig run after the specified time each day. Valid values

are hour:minute, using the twenty-four hour clock notation

Specifying "None" disables starting of the daily checks.

The global file is located on the DP Cell Server under:

Windows (default)   C:\Program Files\OmniBack\Config\Server\Options\global

HP-UX/SUN Solaris/Linux (default) /etc/opt/omni/server/options/global

The daily check triggers an "IDB Purge Required" notification if:

- The time elapsed since the last IDB filename purge exceeds **Days Last Purge [days]** (default, 180 days). At the same time, either the number of filename records likely to be purged exceeds **Num. Estimated Filenames [mio]** (default, 6 millions) or the estimated time needed for the purge exceeds **Estimated Time Purge [min]** (default, 120 minutes).
- The number of filenames in the IDB exceeds **Num. Filenames [mio]** (default, 100 millions).

The filenames purge check carried out as part of Daily Check can be system resource intensive. Therefore, under some circumstances, it might be useful to deactivate this part of the daily health check. It can be switched off by setting the (undocumented in DP 6.0) global parameter `DbPurgeCheck=0`

DbPurgeCheck = 0 or 1

default: 1

If this option is set (=1), IDB purge check will be included

when daily check is started. If this option is not set (=0),

IDB purge check will be skipped. `DbPurgeCheck=0`

If the purge check is switched off as part of the daily health check it needs to be executed manually on a regular basis.

Manual discovery

A filenames purge preview status report can be manually created either using the DP CLI or the Graphical User Interface (GUI).

- DP CLI:

  ```
  omnirpt –report db_purge_preview
  ```

- DP GUI:

  Reporting context, right click on "Reports" and select "Add Reporting Group." Choose a name and click on "Finish." Right click on the newly created Report group, and select "Add Report." In the right pane select the icon to the left of "Reports on the Internal Database." Choose a name and in the "Type:" field select "IDB Purge Preview Report." Click "Next." For "Send method:" select "Log", for "Log to file:" select a temp directory and for "Format:" select "ASCII." Click on "Add" and then "Finish." To run the report right click on it and select "Preview."

Table 1.

Client	# Filename	# Est. Obs	Est. Durat
alpha.xxxx.com	110	30	23
beta.xxxx.com	481	87	100
delta.xxxx.com	80	0	16
gamma.xxxx.com	0	0	0
zeta.xxxx.com	122	42	25
eta.xxxx.com	17	0	3
theta.xxxx.com	506	134	105

Note:
You either have to be added to the Admin user group or granted the reporting, notifications, and event Log user right to run the report.

Automated IDB purging done by the Daily Maintenance

What is the Daily Maintenance?

Daily Maintenance runs a series of commands that purge obsolete data from many sections of the DP IDB. By default, the Daily Maintenance takes place at midday (12:00 Hrs.) each day. It does not purge all parts of the IDB, just the parts that can be done **without exclusive access to the IDB**. (For more information about this, see the Appendix A.)

Setting the time Daily Maintenance runs

The time the Daily Maintenance runs can be changed by the setting Daily Maintenance Time in the global file.

The Daily Maintenance can be disabled by setting Daily Maintenance Time = 99:99 or none in the global file.

Note:
Disabling daily maintenance is not recommended by HP, unless alternative regular arrangements to maintain the DP IDB have been made.

A method to confirm if, and when, Daily Maintenance is being run

Look at the global file for the values of Daily Maintenance Time:

On Windows the file is (default)   C:\Program Files\OmniBack\Config\Server\Options\global

On HP-UX the file is   /etc/opt/omni/server/options/global

For example if you only see

```
 # DailyMaintenanceTime=HH:MM
```
the daily maintenance is running at 12:00

If you see

```
DailyMaintenanceTime=99:99
```
the daily maintenance is disabled

```
DailyMaintenanceTime=None
```
the daily maintenance is disabled

```
DailyMaintenanceTime=08:30
```
the daily maintenance is running at 08:30

If Daily Maintenance is not running

In case Daily Maintenance is disabled consider the following steps:

- In the global file set a time for the daily maintenance to run.
- Manually run the daily maintenance with the command omnidbutil –purge –daily.
- Manually run individual purges that do similar steps to the daily maintenance.

For example

```
omnidbutil -purge –sessions 30
omnidbutil -purge –messages 10
omnidbutil -purge –dcbf
omnidbutil -purge –mpos
```

IDB purging done by the Daily Maintenance

Sessions purge

Expired sessions, older than a certain number of days, are removed from an IDB with the command `omnidbutil -purge -sessions [TimeInDays]`

For example `omnidbutil -purge -sessions 30` removes all expired protection sessions from the IDB that are more than 30 days old.

Example of messages seen at the command line

```
omnidbutil -purge -sessions 30
DONE!
```

Messages purge

Session messages from expired sessions, older than a certain number of days, are removed with

```
omnidbutil -purge -messages [TimeInDays]
```

Example of messages seen at the command line

```
omnidbutil -purge -messages 10
DONE!
```

Dcbf purge

`omnidbutil -purge -dcbf` removes obsolete data from the dcbf part of the internal database.

Example of messages seen at the command line

```
omnidbutil -purge -dcbf
DONE!
```

Mpos purge

`omnidbutil -purge -mpos` ensures the complete removal of any remaining object versions and media position (mpos) records of data on a media where the data has been overwritten.

Example of messages seen at the command line

```
omnidbutil -purge -mpos
Starting Purge for formatted medium (-mpos)
Successfully completed Purge for formatted medium (-mpos)
DONE!
```

`omnidbutil -purge -mpos` is a new purge introduced in conjunction with a variable QuickMediaFormat

Note:
The mpos purge and the variable QuickMediaFormat are available by default on DP 6.11. For DP 6.0 it requires one of the following patches or their successor. Neither the mpos purge or QuickMediaFormat =1 is available for DP 6.1. DP 6.1 customers should upgrade to DP 6.11 for this functionality.

Table 2.

	Windows	HP-UX PA Risc	HP-UX IA 64
Data Protector 6.0	DPWIN_00385	PHSS_38404	PHSS_38405

Explaining QuickMediaFormat

In the course of a backup, DP's Backup Session Manager (BSM) may need to overwrite a media. For media containing a large number of objects and corresponding media positions the purging of this information from the IDB can put a high and sustained load on the process that manages the DP IDB (known as RDS). This sustained load on RDS may give the false impression that DP has hung. This behavior is observed more today than by DP users in the past, because of the large volume of data modern media can hold.

If QuickMediaFormat is set to 1 in the global file, DP will only purge a defined number of records during the backup or when a media is formatted. Other obsolete records will be removed when a purge mpos command is run. If the QuickMediaFormat is not set, all the records will be purged from the database during the backup.

The command `omnidbutil -purge -mpos` can be run to remove the object versions and media position records for the overwritten tapes. Both DP 6.11, and DP 6.0 with the Cell Server patches mentioned in the preceding table, have `omnidbutil -purge –mpos` included as part of the Daily Maintenance. So, this purge will automatically take place every day as long as Daily Maintenance has not been disabled.

Example of messages seen at the command line

```
omnidbutil -purge –mpos

Starting Purge for formatted medium (-mpos)

Successfully completed Purge for formatted medium (-mpos)

DONE!
```

Note:
QuickMediaFormat=1 should not be set at the same time as
DbPurgeExpiredOvers=2.

Tuning Quick Media Format with `FormatOversPerTransaction`

If Quick Media Format is set to 1 the number of Object versions (overs) that will be deleted from the IDB for a media during a backup is tunable with the global setting FormatOversPerTransaction. If DP needs to overwrite a tape during a backup it will remove a maximum number of overs as defined by `FormatOversPerTransaction`. Once that number have been removed from the IDB, the backup will continue. Any remaining obsolete overs will be removed later as part of the daily maintenance (or manually by running the omnidbutil -purge -mpos command). The default value for `FormatOversPerTransaction is 50`.

Manual IDB purge operations

Note:
These commands require Exclusive Access to the IDB, so that no backups are running and no GUIs are open.

On some very busy Cells it can be difficult to book time when no backups are running. This problem may be greater if the Cell Manager is part of Manager of Managers (MoM), as all backups have to be stopped on all Cells in the MoM, in order to run the commands that require exclusive access to the IDB.

Filenames purge

A filenames purge removes obsolete data from the filenames part of the IDB, but leaves filenames records referring to protected data intact.

Running a DP IDB filenames purge **requires exclusive access to the DP IDB**, so no backups can be in progress and all GUIs must be closed. In a MoM environment, DP must not be busy with backups or other activities anywhere on the MoM.

Run a filenames purge on a DP Cell Manager as follows:

- Verify that no backups or restores are in progress by checking that "omnistat" returns:
  "No currently running session"
- Start the purge:
  ```
  omnidbutil –purge –filenames –force
  ```

Note:
Occasionally it will be necessary to stop (omnisv -stop) and start again (omnisv -start) DP before the command will run.

If DP is running within Microsoft Cluster Services (MCSC) or MC/ServiceGuard then omnisv -stop and omnisv -start may not be the appropriate way to stop and start DP.

The filenames purge can be monitored in two ways:-

- Start a GUI and look in the Monitor context
- Look at the file (default location):

on Windows	C:\Program Files\OmniBack\log\server\purge.log
on HP-UX	/var/opt/omni/server/log/purge.log

See Appendix C for an example of the update to purge.log of a completed filenames purge.

If the purge has not finished, but you need to run backups, simply stop the purge with

`omnidbutil –purge_stop` and use DP as normal.

Later, when there is time, start the purge again as previously explained.

Example of messages seen at the command line

```
omnidbutil -purge -filenames –force
Filename purge session started.
```

An alternative way to Filenames purge if time is limited

On a large DP system the full filenames purge done by the `omnidbutil -purge -filenames –force` may take many hours.

It is possible to run the command on an individual host as follows

```
omnidbutil -purge -filenames <hostname> -force
```

Or for several hosts

```
omnidbutil -purge -filenames <host1 … host_n> -force
```

Using these commands effective purging may be achieved in a short time.

To select the hostnames for purging using this method, look at the output of

`omnirpt –report db_purge_preview` (see page 4 of this document for an example).

The hostnames of clients with a large "Est. Obs" value should be given priority.

Frequently asked questions about Filenames purge

Question 1:

Will the force option cause the filenames purge to remove protected data?

Answer 1:

No, a force purge will not remove any protected data from the DP IDB.

A purge without the force option looks for obsolete records for a hostname and only purges those records if there are more than 1000000 obsolete entries.

The –force switch causes DP to purge all expired records even if there are less than 1000000 expired records for a hostname. For this reason the command is much more effective if the –force switch is used.

Question 2:

What happens to scheduled backups that are due to start while the `omnidbutil -purge -filenames` is running.

Answer 2:

Scheduled backups will not start while a filenames purge is in progress.

The consecutive running of a dcbf Purge followed by a fixmpos

`omnidbutil -purge -dcbf`, deletes the dcbf records that are no longer required. However, the mmdb will still have mpos records referring to these removed dcbf records.

Therefore, from time to time we suggest the consecutive running of a dcbf Purge followed by a fixmpos.

`omnidbutil -fixmpos` requires exclusive access to the IDB, therefore the consecutive running of these commands must be done when no backups are in progress.

Example of messages seen at the command line

```
omnidbutil -purge -dcbf
DONE!

omnidbutil -fixmpos
DONE!
```

Note:
See **Appendix D** for information about another manual purge that may, in some circumstances, be required.

New DP 6.11 purge functionality introduced by patches

The patches below, or their successors, include a new global file variable **DbPurgeExpiresOvers**.

Table 3.

	Windows	HP-UX PA Risc	HP-UX IA 64
Data Protector 6.11	DPWIN_00440	PHSS_40470	PHSS_40471

DbPurgeExpiredOvers=0 (default value)

Protection Expired Objects, Object versions and Media Positions are not removed, by the daily maintenance, from the IDB until the medium is overwritten or exported.

DbPurgeExpiredOvers=1

Protection Expired Objects, Object versions and Media Positions are removed from the IDB when the protection of all Objects on the medium have expired.

DbPurgeExpiredOvers=2

Protection Expired Objects, Object versions and Media Positions are removed from the IDB as their protection expires, even though other Objects on the medium are still protected.

The use of DbPurgeExpiredOvers=1 or 2 can help control the IDB size. They may also help reduce the pauses that can occasionally be seen during backups when the records of data on media that are about to be overwritten are removed from the IDB, if default value is set.

Note:
DbPurgeExpiredOvers=2 should not be used in conjunction with QuickMediaFormat=1.

Appendix A

What does "Requires exclusive access to the IDB" mean?

The following three commands mentioned in this document require exclusive access to the IDB

- `omnidbutil -purge -filenames -force`
- `omnidbutil -fixmpos`
- `omnidbutil -purge_failed_copies`

To run any of these commands, DP must not be busy doing backups or other activities.

Close all DP GUIs and confirm that no backups, restores or other DP activities are in progress by checking that "omnistat" returns "No currently running session."

Note:
Exclusive access does not mean that the DP processes must be stopped. But occasionally it will be necessary to stop and restart them before the preceding commands can run.

When doing this, it is good practice after stopping DP (omnisv -stop) to look for any remaining DP processes that may be running and close them before restarting DP (omnisv -start)

On HP-UX proceed as follows:

- Close all DP GUIs
- Make sure DP is not active, `omnistat` returns "No currently running sessions"
- Stop DP processes with `omnisv -stop`
- `ps -ef | grep omni`
- kill any omni processes
- Start DP with `omnisv -start`

On Windows proceed as follows:

- Close all DP GUIs
- Make sure DP is not active, `omnistat` returns "No currently running sessions"
- Stop DP services with `omnisv -stop`
- Open Task Manager and go to the Processes tab
- Highlight Data Protector process and "End Process" them
  Common DP processes are bsm.exe, bma.exe, Manager.exe, dbsm.exe.
- Start DP with `omnisv -start`

Note:
If DP is running within MCSC or MC/ServiceGuard then "omnisv –stop" and "omnisv –start" may not be the appropriate way to stop and start DP.

While a command that requires exclusive access to the IDB is running, scheduled DP backups will not start.

If the Cell Manager where you want to run the command requiring exclusive access to the IDB is part of a MOM you have to stop backups on all Cell Managers that are part of the MoM.

Appendix B

Further information about the IDB Daily Maintenance

The daily maintenance runs the following commands:

- `omnidbutil -purge -sessions <days>`
- `omnidbutil -purge -messages <days>`
- `omnidbutil -purge -dcbf`
- `omnidbutil -purge -mpos`

The `omnidbutil -purge -mpos` purge is available by default on DP 6.11. The purge is not available on DP 6.1, DP 6.1 customers should upgrade to DP 6.11. DP 6.0 requires one of the following patches or their successor.

Table 4.

	Windows	HP-UX PA Risc	HP-UX IA 64
Data Protector 6.0	DPWIN_00385	PHSS_38404	PHSS_38405

The value for the number of days used by the daily maintenance `omnidbutil -purge -sessions <days>` command is determined by the setting of **KeepObsoleteSessions** in the global file.

Windows default location of global file: C:\Program Files\OmniBack\Config\Server\Options

HP-UX location of global file: /etc/opt/omni/server/options

The value for the number of days used by the daily maintenance `omnidbutil -purge -messages <days>` command is determined by the setting value of **KeepMessages** in the global file. The default value for KeepMessages is "0."

Note:
"0" is a valid value for use in the global file; however, it is invalid at the command line for example, `omnidbutil -purge -messages 0` in not valid at the command line.

Appendix C

Example update to purge.log after a completed forced filenames purge

1/12/2009 2:37:09 PM ASM.5312.4976 ["sm/asm/asm_purge.c /main/dp56/1":470] A.06.00
bDPWIN_00385

Purge session started.

1/12/2009 2:37:09 PM ASM.5312.4976 ["sm/asm/asm_purge.c /main/dp56/1":480] A.06.00
bDPWIN_00385

Filename purge session started.

[REPORT_DATA] 1231771029 1231771052 0 0 6

[REPORT_DATA] 1231771053 1231771067 0 0 6

[REPORT_DATA] 1231771067 1231773602 0 1161430 32

1/12/2009 3:20:02 PM ASM.5312.0 ["db/dc/dcpurge/dcpurge.c
/main/dp56/dp60_fix/2":1167] A.06.00 bQXCM1000887045_TM1

[[[Purge session finished]]]]

    Total time: 2573 secs

    Total work time: 2573 secs

    Total inactivity time: 0 secs

1/12/2009 3:20:02 PM ASM.5312.0 ["db/dc/dcpurge/dcpurge.c
/main/dp56/dp60_fix/2":1175] A.06.00 bQXCM1000887045_TM1

[REPORT_DATA] 1231771029 1231773602 0 1161430 32

1/12/2009 3:20:02 PM ASM.5312.864 ["sm/asm/asm_purge.c /main/dp56/1":237] A.06.00
bDPWIN_00385

Purge session finished.

1/12/2009 3:20:03 PM ASM.5312.4976 ["sm/asm/asm_msg.c /main/13":92] A.06.00
bDPWIN_00385

Filename purge session ended.

Appendix D

Failed_copies purge

Table 5.

	Windows	HP-UX PA Risc	HP-UX IA 64
Data Protector 6.0	DPWIN_00385	PHSS_38404	PHSS_38405

In certain circumstances a DP IDB may hold multiple copies of failed objects made during a backup. These multiple copies of failed objects may overload an IDB. A special purge, `omnidbutil -purge_failed_copies`, removes any failed objects that are not the original from the IDB.

DP 6.1 and 6.11 by default, and DP 6.0 with one of the patches above, have two additional functions with respect to these multiple unrequired copies of objects. They allow the running of `omnidbutil -purge_failed_copies` and they correct the behavior that caused the multiple copies of objects. For these reasons once this command has been run it should rarely need repeating.

The command requires exclusive access to the IDB so can only be run when no backups are running and all GUIs are closed.

When run, this purge updates the RDS.log file.

- On Windows the RDS.log file is, by default,
  C:\Program Files\OmniBack\db40\datafiles\catalog
- On HP-UX the debug.log file is: /var/opt/omni/log

Example of messages seen at the command line

```
omnidbutil -purge_failed_copies
```

```
DONE!
```

Example of the update to RDS.log

```
[19-Dec-2008 15:32:22] overs read[346766] overs deleted[309] mpos deleted
[179431]
```

For more information

- Get Help in the DP GUI

  Help menu, Help Topics. Search tab for searching. Contents tab is the equivalent of an Administrator's Guide.
- Chapter 5 of the HP Data Protector Concepts Guide, which is available from the DP GUI, help menu, Online documentation
- The omnidbutil man page:

  On HP-UX this can be accessed by "man omnidbutil"

  On Windows this can be found in the "Command Line Interface Reference," which is installed (by default) in C:\Program Files\OmniBack\Docs\MAN
- The DP 6.0, HP Data Protector Product Announcements, Software Notes
  - References

Glossary

Cell

Cell is a set of systems that are under the control of a Cell Manager. The cell typically represents the systems on a site or an organizational entity, which are connected to the same LAN. Central control is available to administer the backup and restore policies and tasks. A cell consists of a Cell Manager, one or more Installation Servers, client systems, and devices.

Cell Manager

The main system in the cell where the essential Data Protector software is installed and from which all backup, restore, copy, and administrative activities are managed. The GUI used for management tasks can be located on a different system. Each cell has one Cell Manager system and it can also be referred to as Cell Server (CS).

CDB

The Catalog Database (CDB) is a part of the IDB that contains information about backups, object copies, restores, media management sessions, and backed up data. Depending on the selected logging level, it also contains file names and file versions. This part of the database is always local to the cell. This part of the database is always local.

DCBF

The Detail Catalog Binary Files (DCBF) part of the IDB stores information about file versions and attributes. It occupies approximately 80% of the IDB. One DC binary file is created for each Data Protector medium used for backup.

DC directory

The Detail Catalog (DC) directory consists of DC binary files, which store information about file versions. It represents the DCBF part of the IDB, which occupies approximately 80% of the IDB. The default DC directory is called the dcbf directory and is located in the Data_Protector_home>\db40 directory on a Windows Cell Manager and in the /var/opt/omni/server/db40 directory on a UNIX Cell Manager. You can create more DC directories and locate them as appropriate to you. Up to 50 DC directories are supported per cell. The default maximum size of a DC directory is 4 GB.

fnames.dat

The fnames.dat files of the IDB contain information on the names of the backed up files. Typically, these files occupy about 20% of the IDB. Filenames, for reasons of space efficiency and quick access, are stored in pieces across six files (and their extension file, if they exist): dirs.dat, fn1.ext, fn2.ext, fn3.ext, fn4.ext, and fnames.dat.

Graphical User Interface (GUI)

A cross-platform [Windows, HP-UX (PA Risc), Solaris] GUI provided by Data Protector for easy access to all configuration, administration, and operation tasks. It may also be known as User Interface (UI) or Cell Console (CC).

IDB

The Data Protector Internal Database is an embedded database located on the Cell Manager that keeps information regarding which data is backed up, on which media it is backed up, how backup and restore sessions are run, and which devices and libraries are configured.

MoM

Several cells can be grouped together and managed from a central cell. The management system of the central cell is the Manager-of-Managers (MoM). The cells are called MoM clients. The MoM enables you to configure and manage multiple cells from a central point.

MMDB

The Media Management Database (MMDB) is a part of the IDB that contains information about media, media pools, devices, libraries, library drives, and slots configured in the cell, as well as the Data Protector media used for backup.

RDS

The Raima Database Server process (service) runs on the Data Protector Cell Manager and manages the IDB. The process is started when Data Protector is installed on the Cell Manager.

SIBF

The Serverless Integrations Binary Files (SIBF) is a part of the IDB that stores raw NDMP metadata. This data is necessary to perform restore of NDMP objects. Occasionally the SIBF may be used for other data too.

SMBF

The Session Messages Binary Files (SMBF) part of the IDB stores session messages generated during backup, restore, object copy, object consolidation, and media management sessions. One binary file is created per session. The files are grouped by year and month.

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