

# HP Data Protector automatic backup device failover handling

## Session restart handling of clustered HP D2D StoreOnce backup systems

Technical white paper

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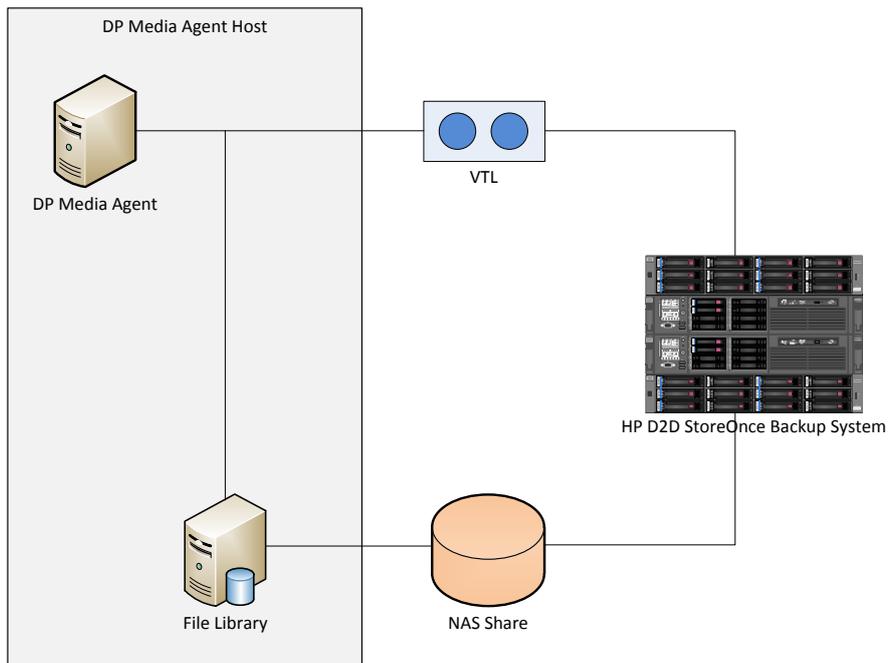
# Introduction

This white paper describes a script-based solution that enables Data Protector to handle failover situations of clustered HP D2D StoreOnce backup systems. The solution allows detecting backup session failures caused by an unavailable HP D2D StoreOnce backup device and automatically restarts the failed session when the backup device has performed a proper failover and is available again.

## Solution Overview

Data Protector can use the HP D2D as backup device in various ways. The D2D system can export a NAS share which can then be used by Data Protector to create a File Library with its storage location configured on the NAS share. It is also possible to configure a Virtual Tape Library (VTL) on the D2D system which can then be used by Data Protector like a normal tape library. The HP D2D system can be configured as a cluster which allows the device to perform a failover operation in case the primary system becomes unavailable. As soon as the cluster failover is completed all the configured devices are available again and can be used by Data Protector as device.

**Figure 1:** Data Protector interaction with the HP D2D system



The script based solution described in this whitepaper allows detecting these failover situations and enables Data Protector to automatically restart a failed backup session as soon as the cluster failover on the D2D system side is complete and the device is operational again.

# Prerequisites for using the HP D2D restart backup scripts

## D2D restart backup scripts

HP provides the script-based solution at the following location:

<http://www.hp.com/go/dataprotector>

The D2D restart backup scripts are supported on HP Data Protector 6.2x and greater.

## HP Data Protector

On the Data Protector side the solution is supported on the following operating systems:

- Windows
- Linux

The solution requires having the D2D restart backup scripts, the DP media agent component and also the DP graphical user interface component installed on the same host.

## Installation

### Installation in the Data Protector Bin or lbin directory

The scripts are part of the standard DP installation, and are delivered with 'CC' (Cell console) patches. They are installed in the bin directory:

- Windows: C:\Program Files\Omniback\Bin
- Linux: /opt/omni/bin

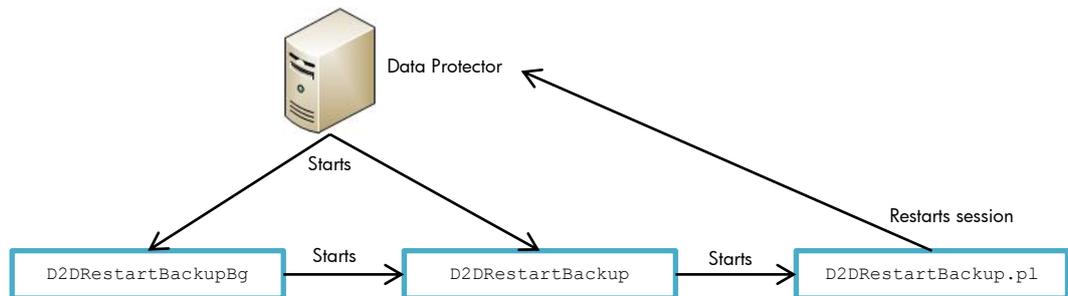
# Configuration of the HP D2D restart backup scripts

## D2D restart backup scripts

### Script location configuration

The solution is preconfigured to run from the Data Protector Bin / lbin directory without modifications. If the scripts are stored in a different directory then some paths in the two available starter scripts need to be adapted. The script `D2DRestartBackupBg` is used to start the second starter script `D2DRestartBackup` asynchronously in the background. The script `D2DRestartBackup` is used to adapt the runtime configuration parameters and to start the D2D restart backup script using Perl.

Figure 2: Script solution execution overview



### Script location configuration on Windows

The following example shows the required modifications on Windows with a default Data Protector installation and the script solution extracted to "C:\tmp".

#### 1. `D2DRestartBackupBg.cmd`

Open the script `D2DRestartBackupBg.cmd` with a text editor. Modify the start line to contain the absolute path to the `D2DRestartBackup.cmd` script. Save the modifications and close the editor.

Example:

Before modification:

```
start D2DRestartBackup.cmd
```

After modification:

```
start C:\tmp\D2DRestartBackup.cmd
```

#### 2. `D2DRestartBackup.cmd`

Open the script `D2DRestartBackup.cmd` with a text editor. Look for a line starting with `perl.exe`. Modify the last parameter of the line to contain the absolute path to the perl D2D restart backup script `D2DRestartBackup.pl`. In addition look for a line defining the variable `DP_HOME_DIR` and modify the value to contain the absolute path to the Data Protector home directory including the trailing backslash.

Example:

Before modification:

```
"perl.exe" -I "..\lib\perl" "D2DRestartBackup.pl"
```

After modification:

```
"perl.exe" -I "..\lib\perl" "C:\tmp\D2DRestartBackup.pl"
```

Example:

Before modification:

```
set DP_HOME_DIR=%DP_BIN_DIR%..\
```

After modification:

```
set DP_HOME_DIR=C:\Program Files\OmniBack\
```

### Script location configuration on Linux

The following example shows the required modifications on Linux with the script solution extracted to "/tmp" instead of the lbin directory.

#### 1. D2DRestartBackupBg.sh

Open the script `D2DRestartBackupBg.sh` with a text editor. Modify the line containing the command variable and use an absolute path to the `D2DRestartBackup.sh` script. Save the modifications and close the editor.

Example:

Before modification:

```
/opt/omni/lbin/D2DRestartBackup.sh
```

After modification:

```
/tmp/D2DRestartBackup.sh
```

#### 2. D2DRestartBackup.sh

Open the script `D2DRestartBackup.sh` with a text editor. Look for a line starting with the perl executable. Modify the line to contain only absolute paths to the Data Protector perl executable, the Data Protector perl library path and to the perl D2D restart backup script `D2DRestartBackup.pl`. The Data Protector perl executable is located in the Data Protector Bin directory (`/opt/omni/bin`). The according perl library path needs to be set to `/opt/omni/lib/perl`

Example:

Before modification:

```
../bin/perl -I ../lib/perl D2DRestartBackup.pl
```

After modification:

```
/opt/omni/bin/perl -I /opt/omni/lib/perl /tmp/D2DRestartBackup.pl
```

### Script runtime configuration

The scripts provide various runtime configuration parameters which allow influencing the behavior of the solution. All configuration parameters need to be defined as environment variables before the scripts are actually executed. This can be achieved by modifying the existing default values in the starter script `D2DRestartBackup`

The following configuration parameters are available:

- `D2DCheckInterval`

The variable `D2DCheckInterval` defines in case of a failure of the primary D2D system the interval in which Data Protector checks if the devices are available again. After a failed availability check Data Protector waits for the configured time until the next availability check is performed. The interval needs to be defined in seconds and the default value is 20 seconds.

- `WaitForD2D`

The variable `WaitForD2D` defines how long Data Protector at a maximum should wait for the cluster failover to complete. If the maximum time is reached Data Protector stops to wait for the failover to complete and the failed session will not be restarted. The wait time needs to be defined in minutes and the default value is 30 minutes.

- `DebugLevel`

The variable `DebugLevel` defines the amount of information printed by the scripts to the log file. The debug level can be set to a value between 0 and 3. Higher values make the script output more verbose. The default value is 1 and instructs the script to display only important information. A value of 0 suppresses even important information so that the script displays only critical errors.

- `D2DPostScriptLogFilePath`

The variable `D2DPostScriptLogFilePath` defines the location where the log files of the scripts are created. The default location on Windows is `C:\ProgramData\OmniBack\tmp` whereas on Linux the default path is `/tmp`.

## HP Data Protector

In Data Protector the scripts need to be configured within the Data Protector backup specification as session post exec scripts. In the `Backup Specification Options` select `Advanced` and add in the `Post-exec` section the `D2D restart backup script`. Select the DP client where the scripts are installed in the `On client` drop down box. Save the backup specification and start or schedule the backup as usual. If the scripts are located in the `Data Protector Bin / lbin` directory then it is sufficient to enter only the script file name otherwise the absolute path to the starter script needs to be specified.

It is possible to enter one of the two different starter scripts which influence the way in which the D2D scripts are used:

- `D2DRestartBackupBg`

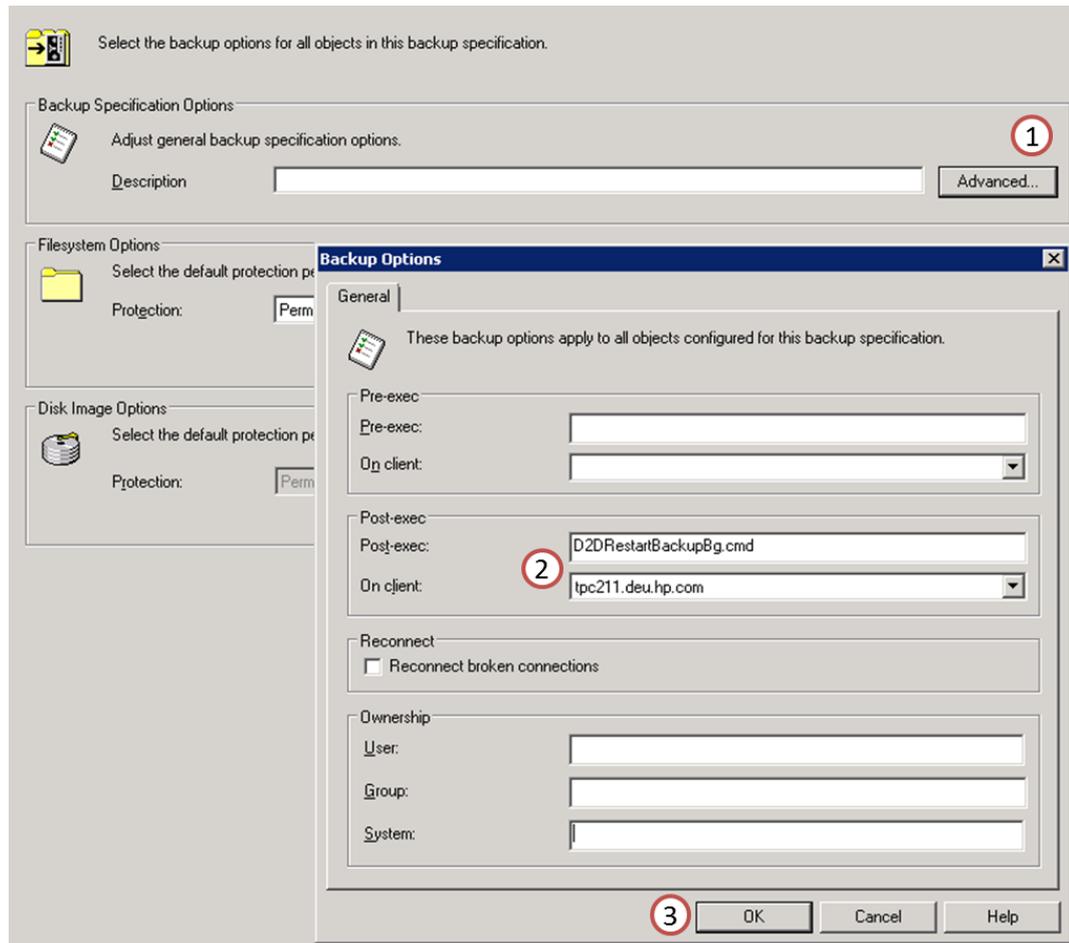
This script starts the D2D restart backup script in the background and allows Data Protector to finish the failed backup session directly afterwards. The output of the D2D restart scripts is only written to the configured log file and is not visible within the DP session log.

- `D2DRestartBackup`

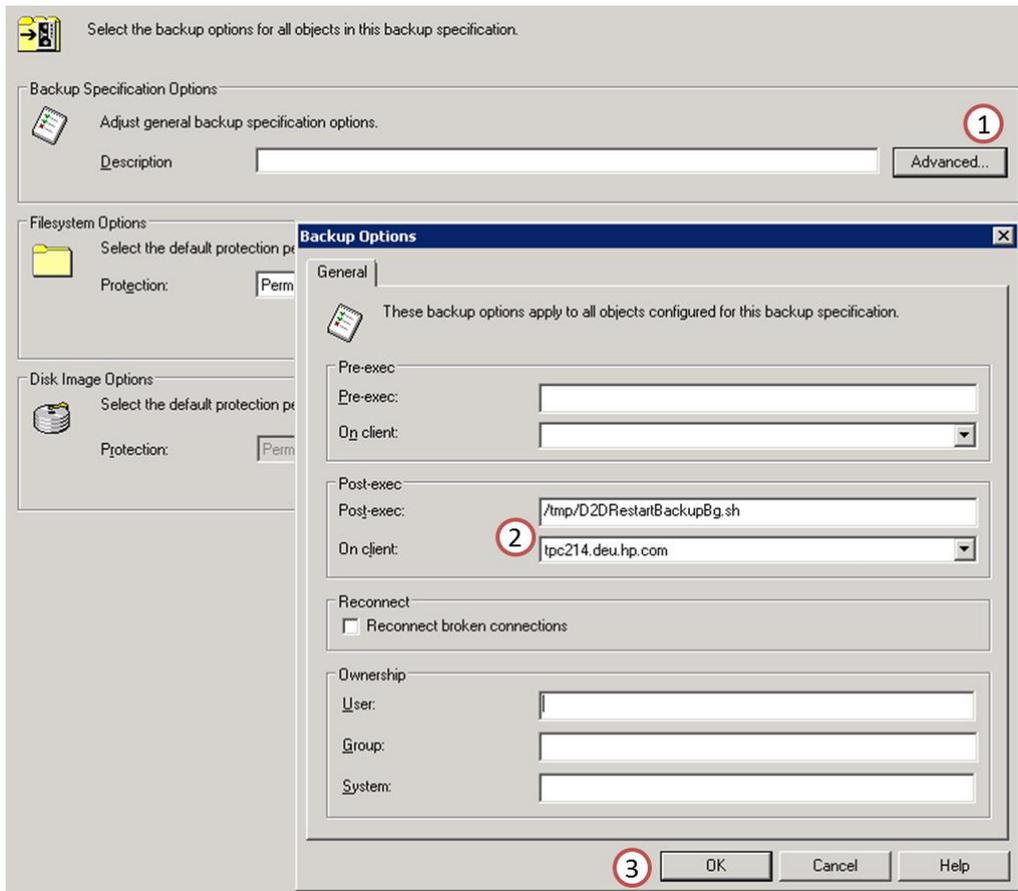
This script directly starts the D2D restart backup script within the DP backup session and reports the information both in the DP session log and also in the log files. A failed backup session does not finish until either the failover operation of the D2D system is complete and the devices available again, or the configured timeout is reached. If the failover operation takes too long and also the timeout parameter `WaitForD2D` is set to a high value then it is possible that the Data Protector backup session manager stops the execution and aborts the session. To avoid this issue either increase the Data Protector timeout or start the solution in the background using the starter script `D2DRestartBackupBg`.

Depending on the operating system the starter scripts are implemented in a different format. For Windows the starter scripts are implemented as `cmd` scripts whereas on Linux they are implemented as shell scripts. It is required to enter the full file name including the file extension in the `Post-Exec` text box. For example on Windows `D2DRestartBackupBg.cmd` needs to be entered and on Linux `D2DRestartBackupBg.sh`

**Figure 3:** Data Protector post-exec script configuration for Windows media agents using relative paths



**Figure 4:** Data Protector post-exec script configuration for Linux media agents using absolute paths



# HP D2D restart script execution and operations

## Conditions for a backup session restart

The scripts evaluate the status of the session at the end of the DP backup session. In case the session is not successfully completed and has not been already restarted the device availability check is triggered. The solution does not attempt to restart a session multiple times but rather finishes the session stating that the session has already been restarted. Backups performed in the preview mode are also never restarted. For a file library stored on a D2D NAS share the session evaluation is only triggered if the media agent was able to access the NAS share at the begin of the backup session.

## Availability check for the D2D system

The device availability check is performed for all devices used in the backup session. The check itself executes different operations depending on the type of the backup device.

A file library stored on a D2D NAS share is checked by trying to access the depot files in the file library repositories. The actual repository directories and the depot file names for the file library are read from the DP cell manager and therefore the scripts automatically get the latest information. A repository directory is considered available as soon as at least one depot file in the directory is accessible again. The whole file library is available if all its repository directories are accessible again.

For a Virtual Tape Library (VTL) the availability check is executed by performing a repository barcode scan on the used library. If the barcode scan fails then the library is considered to be not available. As soon as the barcode scan returns without an error the library is available again and can be used in restarted backup sessions. On Linux the VTL operations can take a considerable amount of time to finish.

When all libraries involved in the backup session are available again then the failed backup session gets restarted.

## For more information

- <http://www.hp.com/go/dataprotector>
- <http://www.hp.com/go/D2D>

## Call to action

<http://www.hp.com/go/dataprotector>



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