

# HP Universal Print Driver and Microsoft Driver Isolation Mode

Rev 11.09.2009



1. Driver Isolation Mode Defined .....	2
2. What is the default isolation mode for Microsoft inbox drivers?.....	2
3. Would a failure in the spoolsv.exe cause the dependent PrintIsolationHost.exe processes to also fail?.....	3
4. What is the UPD install default related to driver isolation mode? .....	3
5. Does the HP UPD support driver isolation mode?.....	3
6. Why is isolation mode disabled as the default for the HP UPD?.....	3
7. What are the steps to define isolation mode for the installed UPD using the PMC? .....	4
8. What are the steps to define isolation mode as installation default? .....	4
9. What are the "DriverIsolation" settings supported in the UPD *.inf? .....	5
10. If UPD is installed, what will be the isolation mode of the second installed instance? .....	5
11. Can UPD driver isolation mode be changed after UPD has been installed? .....	5
12. Will UPD point and print clients inherit the same isolation mode defined on the print server? .....	6
13. Is UPD performance impacted enabling driver isolation mode? .....	6
14. Does HP recommend driver isolation mode for the HP UPD? .....	6
15. Do the HP UPD tools have settings controls specific to isolation mode?.....	6
16. Can PrnBRN manage driver isolation mode?.....	6
17. Is isolation mode on 2008R2 cluster supported? .....	7
18. Can print isolation managed by Microsoft group policy? .....	7

## 1. Driver Isolation Mode Defined

Microsoft Server versions 2000, 2003, 2008, and client versions Windows XP and Vista utilized user-mode Version 3 print drivers that operate in the print spooler process spoolsv.exe. If any driver utilizing spoolsv.exe were to fail, all print operations dependent on the print spool service failed from the shared dependency. Windows 7 and Windows Server 2008R2 introduce isolation of print drivers. Drivers configured in isolation mode run in an independent PrintIsolationHost.exe process which proxies print services to spoolsv.exe. In the event of driver instability or failure, the PrintIsolationHost.exe fails independent of the Spoolsv.exe. Driver isolation applies to usage of the print driver in the spooler context, not use of the print system such as opening the user interface. Two or more drivers can be defined to share a PrintIsolationHost.exe process, or a single driver can be defined to a dedicated PrintIsolationHost.exe process. A driver can only be defined for one mode, and the server supports all three modes in combination.

Driver isolation mode settings for Windows 7 and Server 2008R2:

**No Isolation:** driver runs in spoolsv.exe with no change compared to Server 2003 / Vista / Windows XP / Server 2008 SP2. All drivers set to No Isolation share spoolsv.exe. Failure one driver could cause failure to entire print system.

**Shared:** drivers share the same PrintIsolationHost.exe, separate from spoolsv.exe, but not separate from other drivers within the shared PrintIsolationHost.exe process. Failure of one driver could cause failure of all drivers sharing the isolated process, but not failure to spoolsv.exe.

**Isolation:** each driver runs in its own PrintIsolationHost.exe process, separate from spoolsv.exe, and other drivers in isolation. Failure of one driver would not impact other drivers. Each queue does not operate in its own instance of the printisolationhost.exe. Instead, multiple queues using a single driver will utilize the same instance of isolationhost.exe.

## 2. What is the default isolation mode for Microsoft inbox drivers?

Shared isolation mode is the installed default for drivers shipped in box to Windows 7 and Server 2008R2. The Microsoft XPS Document Writer comes pre-installed set to no isolation.

### 3. Would a failure in the spoolsv.exe cause the dependent PrintIsolationHost.exe processes to also fail?

Each PrintIsolationHost.exe has dependency on the underlying spoolsv.exe. PrintIsolationHost process will become operational when spoolsv.exe recovers, but print job context might be lost from the spooler's stop and restart.

### 4. What is the UPD install default related to driver isolation mode?

For both UPD v4x and v5.0x, traditional and dynamic mode installs, the installation package of the UPD was not changed to default to the new Microsoft feature. UPD will continue to install attached to spoolsv.exe and not default to isolation mode. This is true of for all UPD PDLs (PS/PCL5/PCL6), regardless of install method (install.exe, Add Print Wizard, etc).

### 5. Does the HP UPD support driver isolation mode?

HP developed and tested UPD v5.0x to provide full support for isolation mode. This includes:

- Dynamic Mode
- Traditional Mode, selecting either version specific or standard install
- Two or more instances of UPD in shared isolation
- Combinations of UPD instances defined for isolated, shared or none
- All UPD supported installation methods (ie- Add Printer Wizard, UPD's Install.exe, etc)
- Jobs spooled utilizing EMF. RAW spooling is handled by Application process, not Spoolsv.exe, therefore isolation mode for RAW is out of context.
- Defined to run in isolation via the Print Management Console, by MS policy, and modification to the driver \*.inf files.

UPD v4x was tested on Windows Server 2008R2 and Windows 7 operating system and because of issues found 4x is not supported by HP on these operating systems.

### 6. Why is isolation mode disabled as the default for the HP UPD?

UPD versions released prior to Windows 7 and Server 2008R2 or in development at the time of the new Windows releases do not default install to isolation mode. HP's target direction is define shared isolation as the UPD installation default for the release that follows v5.10.

The default HP UPD installation source package does not have the "DriverIsolation=" setting in the UPD v5.0x inf file. When the setting is absent from the inf file, Win7 and Server 2008R2 installs the driver to run in the

spoolsv.exe process and not shared or isolation mode. Isolation mode is supported in v5x of the UPD with enablement using the Microsoft PMC, MS policy or edit to the \*.inf (each covered in document).

## 7. What are the steps to define isolation mode for the installed UPD using the PMC?

Managing driver isolation setting can be accomplished through the Microsoft Management Console using the Print Management Console snap-in.

**Windows Server 2008 R2**, the Print Management Console (PMC) is automatically installed when you install Print and Document Services role. PMC can be install on to Windows Server 2008 R2 system without making it the print server. Install the Print and Document Services Tools using the Add Features wizard. Assuming the print services role is enabled on the server, the PMC management interface can be accessed: Start, Run, MMC, select File, Add/Remove Snapin, locate Print Management and select Add, then OK. As well, Start, All Programs, Administrative Tools, then Print Management.

**Windows 7**, the Print Management snap-in is automatically installed and available through the Microsoft Management Console. Steps to launch the MMC: Start, type MMC in the 'Search Programs and files' box. Within the MMC, File, Add/Remove Snapin, select Print Management, Add the Local Server, Finish and OK. Tree navigation: Print Management-Printer Servers-[machine\_name]-Drivers, select the UPD, right mouse, Set Driver Isolation.

## 8. What are the steps to define isolation mode as installation default?

Add "DriverIsolation=2" string to a UPD \*.inf file before proceeding with the UPD installation (example section of an UPD \*.inf below). This change can be made to any of the available \*.inf files in the driver package, and changing only one \*.inf file is required. The change tells the installer isolation mode is supported by the driver and defines the installation default. NOTE: any change to the driver \*.INF file breaks the WHQL signature, which results in a warning dialogue prompted during UPD installation.

```
[Version]
Signature="$Windows NT$"
Provider=%HP%
ClassGUID={4D36E979-E325-11CE-BFC1-08002BE10318}
Class=Printer
CatalogFile=hpcu091b.cat
DriverVer=09/01/2009,61.091.13.01
DriverIsolation=2
```

Following installation from the above change, the PMC user interface will display "Shared" in the Driver Isolation column. In addition, right mouse on the UPD, select Set Driver Isolation and it will display "System Default (Shared)" since the setting came from the INF at the time of installation.

## 9. What are the "DriverIsolation" settings supported in the UPD \*.inf?

The UPD supports all settings of driver isolation defined by Microsoft.

DriverIsolation=0

A setting of 0, disabled, is equivalent to the DriverIsolation setting missing from the \*.inf (such as with a legacy driver). The driver being installed will not operate in an isolation mode. However, even if 0 is set, or no entry is made, the OS can still put this driver into isolation mode based on Group Policy settings.

DriverIsolation=2

With this setting added to the UPD v5.0x driver will result in the following:

- WHQL error message at installation "Windows cant verify publisher of this driver software". Select "Install..."
- UPD will be installed in shared isolation mode

## 10. If UPD is installed, what will be the isolation mode of the second installed instance?

Assuming the absence of MS policies for isolation mode, any subsequent install of the same UPD version will have the same isolation mode as the proceeding installation assuming during install "Use the driver that is currently installed" was selected. This step will utilize the \*.inf stored on the local system.

If the user selects "replace the current driver" it will use the \*.inf where INSTALL.EXE was launched. If the selected driver is the same version, all installed instances of that driver version will inherit the defined settings of the \*.inf from the installation directory

## 11. Can UPD driver isolation mode be changed after UPD has been installed?

Through the PMC, options available for the installed UPD driver are None, Shared, Isolation, and System Default (the setting defined in the \*.inf at time of the driver installation).

## 12. Will UPD point and print clients inherit the same isolation mode defined on the print server?

Independent on how isolation mode was defined for the HP UPD on the print server (via the PMC or the \*.inf prior to server installation) the server vended HP UPD to client will not inherit isolation mode settings defined for the server. The vended driver will default to no isolation.

Also remember PnP clients running Vista, XP and Server 2003, isolation mode is not supported.

## 13. Is UPD performance impacted enabling driver isolation mode?

The HP UPD is not unique to other drivers on the system competing for limited shared resources on the server. System resources will be required for driver(s) in isolation mode and the Windows system will manage the resource. For each driver defined to run in full isolation mode a unique instance of printisolationhost.exe must launch, or drivers can share printisolationhost.exe. The trade off exist between stability achieved with driver isolation and resource demands on the print server. To optimize performance of the system, the Microsoft operating system will open and close printisolationhost.exe as required during print service operations.

## 14. Does HP recommend driver isolation mode for the HP UPD?

The driver HP UPD will have identical functionality in either mode. The decision to run the HP UPD, or any other HP driver in isolation mode, should be based upon resources of the machine and stability of all drivers sharing either spoolsv.exe or PrintIsolationHost.exe. A reasonable approach is test new or suspect drivers in full isolation, monitor resources, and assess driver stability before including the driver in shared isolation or without isolation from spoolsv.exe. A second reasonable approach is place drivers in isolation for the protection of the core printing subsystem.

## 15. Do the HP UPD tools have settings controls specific to isolation mode?

HP UPD tools such as MPA, DCU, DDU, AD Template, and UPD's install.exe do not have driver isolation settings. Driver isolation mode definition can be managed through the PMC, PRNBRN, MS Policy or defined in the driver \*.inf prior to installation.

## 16. Can PrnBRN manage driver isolation mode?

The new PrintBRM tool allows you to export / migrate the Print Driver Isolation settings. PrintBRM was introduced in Windows Vista and Windows Server 2008 as the replacement for the PrintMig utility.

## 17. Is isolation mode on 2008R2 cluster supported?

Microsoft does not document isolation mode as a feature available only to non cluster implementations.

## 18. Can print isolation managed by Microsoft group policy?

Two settings exist.

1. Computer Configuration / Administrative Templates / Printers / **Execute print drivers in isolated processes**. The operating system's online help states:  
*If you enable or do not configure this policy setting, the print spooler will execute print drivers in an isolated process by default.*  
*If you disable this policy setting, the print spooler will execute print drivers in the print spooler process.*
2. Computer Configuration / Administrative Templates / Printers / **Override print driver execution compatibility setting reported by print driver**. The operating system's online help states:  
*This policy setting determines whether the print spooler will override the Driver Isolation compatibility reported by the print driver. This enables executing print drivers in an isolated process, even if the driver does not report compatibility.*  
*If you enable this policy setting, the print spooler will ignore the Driver Isolation compatibility flag value reported by the print driver.*  
*If you disable or do not configure this policy setting, the print spooler will use the Driver Isolation compatibility flag value reported by the print driver.*