



SYSTEM ADMINISTRATOR'S GUIDE

For HP V3 UNIVERSAL PRINT DRIVER (PCL 6/PS)
and HP Print Administrator's Resource Kit (PARK)
November 2017





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Table of Contents

1	Purpose and scope	17
	Introduction	17
	Conventions used in this guide	19
	Devices Supported	19
2	Software description	21
	Introduction	21
	Easy management tools help meet your unique needs	21
	Helps reduce paper use and save money	22
	Helps increase productivity, reduce support calls	22
	System requirements.....	22
	Supported Operating Systems	22
	Port Monitor	22
	Print Processor	23
	Internet Printing Protocol (IPP).....	23
	Software availability	24
3	Planning an HP UPD deployment	25
	Introduction	25
	The five steps to a successful deployment.....	25
	Initiation and planning.....	26
	Understand your printing requirements and environment	26
	Determine deployment objectives	26
	Print servers or Direct IP	26
	Identify stakeholders.....	26
	Make an inventory	26
	Consider PDL needs	26
	Driver considerations.....	27
	Pre-configuration, policy and access requirements	27
	Environment and network compatibility	27
	Baseline the system	27
	Risk management.....	27
	Key deployment decisions.....	27
	Create a list of required drivers	27
	Choose an installation method	28
	Determine Driver Pre-Configuration needs	28
	Choose traditional and dynamic mode	28
	Decide whether to manage the HP UPD with Active Directory Group Policy	29
	Estimate time requirements.....	29

Communication and training.....	29
Training.....	29
Conduct a pilot test environment.....	29
Testing and Evaluation	29
Deploy to production.....	30
Closing the project.....	30
4 Pre-configuring default settings and print policy for HP UPD	31
Introduction	31
HP Print Administrator Resource Kit (HP PARK).....	32
Supported tools	32
Unsupported Tools	33
Configure HP UPD default settings using INSTALL.EXE during driver installation	34
Configure HP UPD default settings and/or print policy using Group Policy Objects in Active Directory	35
You-Tube Video.....	35
Pre-configure HP UPD default settings using the HP Driver Configuration Utility	36
Pre-configure the HP UPD using HP DCU.....	36
You-Tube Video.....	38
Pre-configure HP UPD default settings using HP Driver Deployment Utility	38
Pre-configure the HP UPD using HP DDU.....	39
Configure HP UPD default settings after driver installation in driver preferences.....	41
Manage printer default settings	41
Manage default settings with Active Directory Group Policy for HP UPD in dynamic or traditional mode	41
You-Tube Video.....	41
Overview of configurable functions and pre-configuration utilities	42
5 Installing and uninstalling the HP UPD.....	45
Introduction	45
Supported modifications of the HP Universal Print Driver.....	46
Install HP UPD v5.1 and later.....	46
Determine the HP UPD version installed	46
Microsoft Windows Driver Architecture	46
HP UPD installation methods	47
Explanation of the driver name.....	48
HP UPD name selection.....	49
Identify the driver name for the HP UPD printer.....	50
Download and unzip the HP UPD installation files.....	50
Installation methods and environments.....	50
Method 1: Windows client/server: Use Add Printer wizard	51
Method 2: Windows client/server: Use INSTALL.EXE wizard.....	52

Method 3: Windows client/server: Use command prompt (INSTALL.EXE with switches)	53
Manage printer default settings after installation.....	54
Default settings and changes are not managed.....	54
Manage default settings with Active Directory Administrator Templates	54
Available options when installing by command prompt.....	54
Method 4: Windows client/server: Use Point and Print	57
Method 5: Windows client/server: Use HP Web Jetadmin Print Queue Creation.....	58
Method 6: Create a driver instance with plug and play	58
Software first (unattended) installation – recommended.....	58
Pre-configure and install the HP UPD for use with software first installation	
.....	59
Driver selection when multiple drivers are pre-loaded	59
Hardware first installation	59
USB connectivity	59
Disabling HP Smart Install (if present)	59
How to disable HP Smart Install.....	60
Disable obtaining driver software from Windows Update by default (optional)	
.....	60
Pre installing the HP UPD Using Install.exe.....	61
You-Tube Video.....	64
Pre installing the HP UPD using pnputil.....	64
Pre-installing using the HP Smart Device Agent Base for USB Plug and Play	66
To install the HP Smart Device Agent Base for USB Plug and Play.....	66
To Uninstall the HP Smart Device Agent Base Service	68
Method 7: Other supported Microsoft driver installation methods.....	69
Environment A: Windows Cluster server environment.....	69
Alternative install with printer automatic configuration disabled.....	70
Environment B: Windows Terminal Server/Citrix XenApp environments.....	71
Supported environments	71
Traditional Mode.....	71
Dynamic Mode.....	71
Comparing HP and Citrix UPD Drivers.....	71
Environment C: Novell / Micro Focus	71
Install the HP UPD in a Novell environment.....	72
Novell Distributed Print Services (NDPS).....	73
Uninstall the HP UPD	73
6 Upgrading the HP UPD	75
Introduction	75
Best practices—upgrade	76

Reasons to upgrade	76
Predictable upgrades	76
Changing PDLs	76
Testing	76
Printer name should be different than the driver name	76
Benefit of using HP UPD version specific driver name installation	77
Modify existing HP UPD printer with INSTALL.EXE	77
Upgrade steps	77
Settings retention.....	77
Upgrade steps	78
Delete and recreate queues with AUTOUPGRADEUPD.EXE (traditional mode only)	79
Usage	79
You-Tube Video.....	80
7 Using the HP UPD	81
Introduction	81
Using the HP UPD—traditional mode only	81
HP UPD traditional mode	81
Print using the HP UPD in traditional mode	81
Using the HP UPD — dynamic mode only	82
HP UPD dynamic mode.....	82
Print using the HP UPD in dynamic mode.....	82
Dynamic mode options—Default configuration	83
Using dynamic mode.....	83
Selecting a recently used printer	83
Additional options:	84
Configure HP UPD dynamic mode settings	84
Find a printer in dynamic mode	86
Enter a print address (dynamic mode)	86
Search for network printers (dynamic mode)	88
Search for print shares (dynamic mode)	89
Add a printer to the Devices and Printers folder (dynamic mode)	89
Add a printer to the Printers folder using the dynamic mode user interface.	89
Add a printer to Devices and Printers folder from within the Devices and Printers folder (dynamic mode).....	90
Organize the Recently Used Printers list (dynamic mode).....	91
Using the HP UPD features (traditional mode and dynamic mode)	91
Change Print Driver Settings.....	91
Device mode versus Capabilities mode	91
Printing Preferences Tab Set	92

Advanced Tab Features	93
Printing Shortcuts Tab Features.....	96
Use defined printing shortcuts.....	97
Create a custom printing shortcut	97
Paper/Quality Tab Features	97
Add custom paper sizes	101
To specify Special pages for the Covers or other pages	102
Effects Tab Features	103
To create a new watermark.....	106
Default watermark settings.....	108
Finishing Tab Features.....	108
Book and Booklet Printing	111
Configuring Booklet Printing.....	112
Output Tab Features	112
Output Options	113
Output Bin Options	113
Job Storage Tab Features.....	114
How the HP UPD works with job storage	115
To use HP Secure Encrypted Print	115
Setup and configuration	116
To use Job Storage features when printing	117
Release a job-storage print job	118
Delete a job-storage print job	118
Pre-configure job storage capabilities	119
Color Tab Features.....	120
Services Tab Features	125
Internet Services.....	125
Change HP UPD properties (for all jobs or per job)	125
All jobs — from the Devices and Printers folder.....	125
Per job — when printing from an application	126
Incompatible Print Settings messages	126
Device Settings Tab Features	127
Mopier mode and collation	132
Printer Automatic Configuration	132
Automatic Printer Configuration status.....	133
Traditional Mode About status.....	133
User interface	134
Command line interface	135
Disable Printer Automatic Configuration	140

Benefits comparison.....	140
Automatic configuration enabled.....	141
Automatic configuration disabled.....	141
Default capabilities without automatic configuration.....	141
Steps to disable the Printer Automatic Configuration.....	142
Communication protocols.....	143
Printer Automatic Configuration services.....	143
Steps to Disable.....	143
Steps to Remove.....	143
Symptoms when Printer Automatic Configuration fails.....	144
Printing from a specified tray.....	144
Known issue with redirected printers.....	145
Troubleshooting.....	145
1. Can the HP UPD print to the target device?.....	145
2. Is the HP UPD printer defined with Printer Auto Configuration enabled?.....	145
3. After running "Update Now" were the expected results returned?.....	145
4. What is the physical connection method between the HP UPD installed printer and the target printing device?.....	146
5. Troubleshoot network connection/port.....	146
6. Distinguish if target product is communicating bidirectional for printer auto configuration via HTTP or SNMP?.....	147
HTTP.....	147
SNMP.....	147
7. Install and test a new print queue?.....	147
8. Is the network congested?.....	147
Frequently Asked Questions.....	148
8 Managing the HP UPD with Active Directory Group Policy.....	153
Introduction.....	153
Supported HP UPD versions.....	153
You-Tube Video.....	153
Use HP Active Directory Group Policy to manage HP UPD policies.....	154
HP UPD Active Directory Group Policy.....	154
Introduction.....	154
Install and use the ADM template using Microsoft Group Policy Management Console (GPMC).....	155
Install and use the ADMX/ADML template using Microsoft Group Policy Management Console (GPMC).....	155
Remove the HP UPD AD Administrator template.....	156
Upgrade the HP UPD AD Administrator template.....	156

Enable Active Directory Group Policy for HP UPD for a new or existing HP UPD installation	156
For new installations of the HP UPD when an HP Active Directory Administrator Template is installed.....	156
For existing installations of the HP UPD	156
Configure policies with the HP UPD Active Directory Administrator template	157
UseMode Settings: General Settings	157
UseMode Settings: User Interaction Settings	158
UseMode Settings: Enabled Services tab	158
Default Print Settings.....	158
Color Access Control: Application Filtering	160
Color Access Control: Time of Day Restriction	160
User Search Capabilities	160
Status Notification Pop-ups	160
Job Accounting	160
Job Delivery	161
MPP Information Settings.....	161
Managed Printer List settings	161
Implement Managed Printer Lists (MPLs) within the HP UPD Active Directory Administrator Template file	161
Verification and troubleshooting	162
Functional test	162
Registry population.....	162
Final test	162
How HP AD policies get applied to the driver.....	163
9 Using Managed Printer Lists	165
Introduction	165
Who should use MPLs?.....	165
Exporting a new MPL from HP Web Jetadmin	166
The Exported WJA Managed Printer List XML File Format	169
Implement Managed Printer Lists (MPLs) within the HP UPD Active Directory Administrator Template file	169
Use the Active Directory Administrator Template	170
View results	171
Implement Managed Printer Lists (MPLs) within the HP UPD using Install.exe	172
Troubleshooting.....	172
Problem:	172
A HP UPD new features and OS support changes.....	173
Introduction	173
New Features in HP UPD 6.5.0.....	174

HP PARK tools support changes	174
DCU 1.650.1.32821	174
AD Template 4.5.0.....	174
New HP UPD Features.....	174
HP UPD 6.5.0 with version 4.5 firmware and Capabilities mode	175
Capabilities mode added to older products	176
Differences in the Control Panel U/I	177
Changes to the Device Settings tab	178
Changes to the Print Quality Settings	179
Changes to the Output tab settings.....	181
Fast Booklet mode on HP MFP S900 printers	182
Deprecated Features.....	183
New Features in HP UPD v6.4.1	183
OS support changes.....	183
HP PARK tools support changes	183
New Features	183
Print Quality Settings	184
Output Device Settings.....	185
Group Watermarks	187
Changes for Black Only or High Quality CMYK Grayscale dropdown	187
New features in HP UPD v6.3.0	188
New Features	188
New features in HP UPD v6.2.1	188
New Features	188
New features in HP UPD v6.2.0	188
PDL support change.....	188
New Features	188
New features in HP UPD v6.1.0	189
OS support change.....	189
New Features	189
New features in HP UPD v6.0.0	189
OS support change.....	189
New Features	189
New features in HP UPD v5.9.0	190
New Features	190
New features in HP UPD v5.8.0	190
New Features	190
New features in HP UPD v5.7.0	190
New Features	190

	New features in HP UPD v5.6.5	191
	PDL Change	191
	New Features	191
	Driver Versioning	191
	New HP UPD Installer	192
	New features in HP UPD v5.6.0	193
	OS support change.....	193
	New Features	193
	New driver initialization.....	193
	Policy settings enforced for printing defaults.....	193
	USB DOT4 driver for Windows 8/8.1 and Windows Server 2012/2012R2	193
	New features in HP UPD v5.4	194
	New Features	194
	Automatic Configuration Disabled status	194
	Request for PIN print for every new print job	194
B	Known issues	195
	High resolution TIFF files not printing correctly with HP UPD PCL 6.....	195
	Steps to Resolve the issue	195
	HP Laserjet 400 Color M451dw installed as imaging device	196
	Method to delete the HP PNP Scan Null driver.....	197
	To reinstall the scan null driver:.....	197
	Alternative method for Windows 7:.....	198
	HP UPD Null Scan driver.....	198
	Introduction	198
	Install a Scan driver with and without HP UPD pre-installed.....	199
	Replace the HP PNP Scan Null driver with a product-specific Scan driver	199
	Issues after upgrade from HP UPD v5.2.x	200
	Introduction	200
	Symptoms.....	201
	Steps to avoid the HP UPD v5.2 upgrade issue	201
	Steps to resolve the v5.2 upgrade issue	202
	Steps to delete a printer	202
	Steps to delete the print driver (optional)	203
	Steps to create the printer with same name.....	203
	Point and print	203
	Automating the steps.....	203
	Settings issues after upgrading HP UPD	204
C	Third-party articles and Windows printing information	205
D	Frequently asked questions	209

	Introduction	209
	HP UPD installation and configuration	209
	HP UPD policy	212
	Operating system	213
E	HP UPD deployment worksheet	215
	Introduction	215
	General information	215
	Port and protocol information	216
	Print server environment	217
	Print server information	217
	Goals	217
	Set up new server that has new queue names	218
	Upgrade print queues on an existing server to the HP UPD	218
	Point and Print Client Information	219
	Direct IP printing	220
	General client information	220
	Goal	220
	Upgrade-Drivers:	220
	Upgrade-Settings configuration	221
	HP UPD/AD customized options	221
F	HP UPD deployment flowcharts	223
	Introduction	223
	Start	224
	Choose PDL (PCL 6 or PS)	224
	Citrix environment	224
	Novell environment	225
	Microsoft Windows Print Server	225
	Direct IP printing	225
	Client driver deployment and software distribution systems	226
	Update server/replace server	227
	Update server	227
	Create a test server?	227
	Replace server–clean start	228
	Replace server, import drivers and queues from the old server	228
	Client printing	229
	Replace client, clean start	229
	Replace client, import drivers and queues from old client	229
	Update client	230
	Policy	230

Policy/MPLs per machine?	231
Policy/MPLs per user or group?	231
Use Active Directory?	231
Add/new queues	232
Add queues	232
New queues.....	233
Prepare list of printers, queue and port names, and port settings.	233
Prepare list of drivers required for printer models.	233
Print server?	233
Create queues	234
Will drivers other than the HP UPD be installed?.....	234
Cluster Server?.....	234
HP DCU only settings?.....	235
Install.exe setting only?	235
HP DCU and INSTALL.EXE settings?	235
Notes	235
Ports and protocols.....	236
Port Monitor?	237
Replace drivers.....	237
Versioning of print driver shared files	238
Basic Printing.....	238
Complex Print Environments.....	239
Solution.....	240
Automate the process through scripting.....	240
Get queue and port information from old server or client.....	240
Creating print queues and ports	240
Other scripting examples.....	240
G Support information to collect.....	241
Introduction	241
Symptoms.....	241
Print driver	241
Determine the HP UPD driver version.....	241
Determine the installation details	242
Is Printer Automatic Configuration enabled (default)?	242
What is the “Configuration Status” provided on the About tab?	242
Management Tools.....	242
Environment specifications.....	243
Version of Microsoft operating system (print server and print client)	243
Microsoft Event log (spooler errors, etc)?	243

Printer connectivity	243
Citrix.....	243
Microsoft Terminal Services	244
Novell.....	244
Printer information	244
Application	244
Files to collect.....	245
H Glossary of terms.....	247

1 Purpose and scope

Introduction

This system administrator's guide provides information about the HP V3 Universal Print Driver (HP UPD) and the available HP UPD tools, HP Printer Administrators Resource Kit (HP PARK). For each output format (PCL 6 and PS), a separate downloadable driver exists. Because the core code and functionality are the same for all formats, this documentation refers to HP UPD without specifying the output format.

NOTE: The information in this document is based on the latest information available at writing. Always refer to www.hp.com/go/upd for the most current information. Information on this site supersedes information in this document.

Generally, procedures in this document represent the steps required when using Microsoft Windows 7. The steps for other Windows operating systems may differ slightly.

This guide is distributed in an electronic format to serve as a quick-reference tool for information technology administrators, customer-care agents, support engineers, system administrators, management information systems personnel, and printer users.

NOTE: Send suggestions for improvements, comments, and questions about the HP UPD or questions about the unsupported tools from the HP Printer Administrators Resource Kit (HP PARK) to UPD_PARK@hp.com.

This guide includes the following information:

- Procedures for installing and uninstalling software components, including command line configuration and installation of the HP UPD.
- Descriptions of the HP Universal Print Driver (HP UPD), and the features, benefits, use and management of the HP UPD.
- Descriptions of the HP Active Directory Administrator Template used to manage the HP UPD. Used by administrators to configure and manage the HP UPD.
- Descriptions of the HP Driver Configuration Utility (HP DCU) and an introduction to the features, benefits, and use.
- Descriptions of the HP Driver Deployment Utility (HP DDU) and an introduction to the features, benefits, and use.

The following table describes the structure of this HP System Administrator's Guide. For more information about the location of information within these chapters, see the table of contents.

Table 1-1 HP Universal Print Driver System Administrator's Guide Overview

Chapter	Content
Purpose and scope (Chapter 1)	Describes the focus and intent of this guide, including the conventions used, and the hardware to which this guide pertains
Software description (Chapter 2)	Describes the HP UPD software, including the software requirements for installing the HP UPD and software availability. In addition, this chapter describes the different driver page description languages (PDLs), HP PCL 6 and HP PS emulation, their specific purposes, and the modes for installing these HP UPD versions.
Planning an HP UPD deployment (Chapter 3)	Provides information for planning and deploying the HP UPD in your environment
Pre-configuring default settings and print policy for HP UPD (Chapter 4)	Includes information about the methods for pre-configuring the HP UPD including the following methods: <ul style="list-style-type: none"> • Using INSTALL.EXE • Using the Group Policy Objects in Active Directory • Using the HP Driver Configuration Utility (HP DCU) • Using the HP Driver Deployment Utility (HP DDU)
Installing and uninstalling the HP UPD (Chapter 5)	Provides instructions for the installation and uninstall of the HP UPD in traditional mode and dynamic mode
Upgrading the HP UPD (Chapter 6)	Provides instructions for upgrading the HP UPD
Using the HP UPD (Chapter 7)	Includes information about using the HP UPD in traditional mode and dynamic mode including: <ul style="list-style-type: none"> • Printing using the HP UPD • Finding a printer in dynamic mode • Adding a printer to the Devices and Printers folder • Configuring the HP UPD settings and properties • Adding custom paper sizes • Using job storage • Using HP Secure Encrypted Print • Making changes to HP UPD settings and properties • Known issues with redirected printers • Printer Automatic Configuration • Troubleshooting Help
Managing the HP UPD with Active Directory Group Policy (Chapter 8)	Manage Active Directory Group Policy with the HP UPD using HP Active Directory Administrator Templates
Using Managed Printer Lists (Chapter 9)	Provides information on using managed printer lists to specify the products that users can use for printing.
HP UPD new features and OS support changes (Appendix A)	Describes new configuration features for different releases of the HP UPD
Known issues (Appendix B)	Provides information and steps for resolving known issues in the HP UPD
Third-party articles and Windows printing information (Appendix C)	Lists important Microsoft® Knowledge Base articles
Frequently asked questions (Appendix D)	Answers common questions regarding the HP UPD
HP UPD deployment worksheet (Appendix E)	Provides a worksheet containing HP UPD deployment line items
HP UPD deployment flowcharts (Appendix F)	Contains flowcharts describing deployment options for the HP UPD
Support information to collect (Appendix G)	Contains a list of support related questions for troubleshooting the HP UPD issues
Glossary of terms	Contains explanations of commonly used terms in reference to the HP UPD

Conventions used in this guide

This guide uses the following conventions:

- Keyboard keys display in bold type. For example, Press the **Shift** key.
- File names and file extensions appear in uppercase.
For example, Find the SAMPLE.TXT file in the C:\Temp directory.
- Menu names, field names, and options to select display in bold type.
For example, On the **File** menu, click **New**.
- Windows®, screens, and panels display in bold type.
For example, the **Job Manager** dialog box displays.
- References to other sections in this guide appear in colored font.
For example, for more information, see [Software description](#).

Devices Supported

For a list of the current supported HP devices, see **Supported products** at www.hp.com/go/upd

2 Software description

Introduction

This chapter contains the following sections:

- **System requirements**
- **Software availability**

The HP Universal Print Driver (UPD) helps eliminate driver chaos in your print environment by dramatically reducing the number of print drivers needed. Broad compatibility ensures the HP UPD works with many HP print products, often reducing print driver use to a single driver. For each output format, there is a separate downloadable driver.

- The PCL 6 and PS HP Universal Print Driver works well with a broad range of networked and direct-connected HP LaserJet and HP Business Inkjet/OfficeJet print products. HP products share state-of-the-art technology, allowing the HP UPD to support complex capabilities across many HP products, making them easier to use, support, certify and deploy.
- Install the HP UPD in traditional or dynamic mode.
 - **Traditional mode** — Behaves like a product specific driver, creating a permanent instance of the driver. Use in point and print environments or with direct IP printing.
 - **Dynamic mode** — Allows the most flexibility. A user can find and print to any supported HP product within most network or print environments without installing a product-specific driver. The HP UPD discovers the product capabilities so that users can print using most of them, including advanced printing options such as watermarks and booklet printing.
- Local language drivers are available in 35 spoken languages.

Easy management tools help meet your unique needs

HP provides tools and services to customize and manage drivers and printers, so you can choose driver capabilities that best suit your unique environment, from managing print queues and color use, to ensuring secure printing for sensitive documents.

- Using the HP Driver Configuration Utility (HP DCU), you can pre-configure the driver, which allows you to use the standard Windows driver installation procedure.
- The HP Driver Deployment Utility creates a single executable file for an HP UPD installation with customized pre-configured driver settings.
- Using the Active Directory Group Policy, you can define print policies for the HP UPD when installed in traditional or dynamic mode.
- HP Web Jetadmin allows you to create print queues and update drivers on remote systems from one location. For more information on HP Web Jetadmin, see www.hp.com/go/wja.

Helps reduce paper use and save money

- The HP Universal Print Driver's **EcoSMART Settings** short cut has two-sided printing enabled, making it easier to reduce paper use.
- The HP Active Directory Administrator Templates support a variety of policy controls that can help your company lessen its impact on the environment and save money via your HP LaserJet print products. The Duplex Default setting reduces paper use.

Helps increase productivity, reduce support calls

- The HP Universal Print Driver enables advanced functions on all the printers it supports, from two-sided printing and stapling to Private (PIN) Printing and color themes, so users are not held up or held back by a lack of advanced print features.

NOTE: For Windows 8/8.1 and later Windows operating systems, Dynamic mode is only supported in Windows desktop applications.

- The HP Universal Print Driver supports PCL 6 and postscript emulation printer languages.
- By providing real-time print job and print product information, the HP Universal Print Driver empowers you to resolve common problems and place fewer calls to the help desk. This can mean faster problem resolution, improved printer uptime, and increased productivity.

System requirements

Supported Operating Systems

For information on supported client and server operating systems, see **Specifications** at www.hp.com/go/upd or the current HP UPD release notes at www.hp.com/go/upd under **Documents and whitepapers**.

Port Monitor

The port monitor that the HP UPD uses and recommends is the Microsoft standard port monitor (Standard TCP/IP Port Monitor). The standard port monitor was introduced in Microsoft Windows 2000 and uses the Simple Network Management Protocol (SNMP) to read the configuration of the target print device and to determine the device's detailed status. Additionally, the standard port monitor offers more accurate error reporting than the limited print error messages that might be enabled by other port monitors, such as the LPR port monitor.

The HP UPD Port monitor is used only to provide a print path to UNC paths or shares, send print settings to a local printer, and send jobs to a defined HTTP location for job tracking.

Print Processor

The HP print processor (hpcppxyz where “xyz” is based on the driver version such as hpcppp190 for UPD 6.3.0) provides additional functionality for numerous page manipulation features when compared to the standard print processor (winprint) available with Windows. The HP print processor is used in the Unidrv-based drivers, and is one of the essential components in HP driver architecture providing functionality such as collation, booklet making, scaling, watermarks, and N-UP ordering of pages.

The print processor can be selected in the **Advanced** tab of **Printer properties** by clicking **Print Processor**.

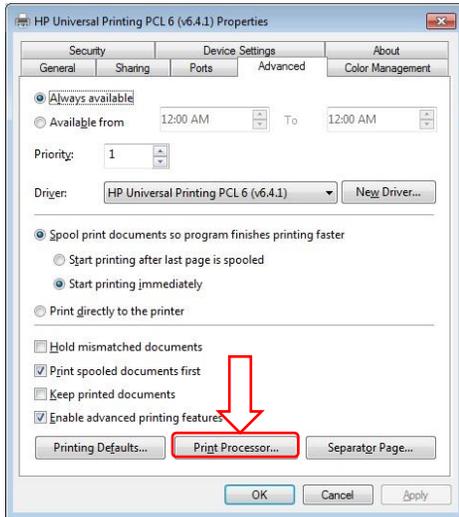


Figure 2-1 Print Processor button on the Advanced tab

The HP print processor is the HP tested configuration for the HP UPD. Non-HP print processors are not supported.

Internet Printing Protocol (IPP)

HP UPD supports Internet Printing Protocol for Traditional Mode Print Queues

- HP UPD Dynamic mode is not supported
- HP UPD uses SNMP to communicate device status and capabilities to the printer driver
- IPP does not support SNMP. Instead, the protocol defines a feature request/reply SOAP packet pair. However, HP UPD does use SNMP queries to complement the list of features in addition to the method defined by the IPP protocol. SNMP is done during queue creation even with an IPP port.
- HP recommends utilizing the HP Driver Configuration Utility to define the print device features for use with the HP UPD

Software availability

The HP Universal Print Driver (HP UPD) is available in the following languages:

Table 2-1 HP UPD supported languages

Arabic	Bulgarian	Catalan	Croatian
Czech	Danish	Dutch	English
Estonian	Finnish	French	German
Greek	Hebrew	Hungarian	Italian
Japanese	Korean	Latvian	Lithuanian
Norwegian	Polish	Portuguese (Brazilian)	Romanian
Russian	Serbian (Latin)	Simplified Chinese	Slovak
Slovenian	Spanish	Swedish	Thai
Traditional Chinese	Turkish	Ukrainian	

NOTE: If the HP UPD is used to print to an unsupported product, HP recommends using the HP UPD PS for best print results.

3 Planning an HP UPD deployment

Introduction

This chapter is designed to help you make strategic deployment decisions as you integrate the HP UPD into your printing environment. The deployment of the HP UPD in your printing environment will be unique based upon your specific objectives and current IT infrastructure. This chapter assumes that you have a basic understanding of the functionality of print drivers and the Windows printing architecture.

This chapter provides you with options and recommendations to customize your deployment experience based on your current printing environment and your printing goals and objectives. Although your environment will vary slightly from the installation models below, you should be able to use the recommendations in this document so that your HP UPD deployment will be smooth and have the least impact to your printing environment. In some cases you will use more than one solution provided in the information below.

This chapter contains the following sections:

- **The five steps to a successful deployment**
- **Initiation and planning**
- **Communication and training**
- **Conduct a pilot test environment**
- **Testing and Evaluation**
- **Deploy to production**

The five steps to a successful deployment

1. **Initiation and planning**
 - Fully understand your printing requirements and environment
 - Make decisions
2. **Communication and training**
 - Executive sponsorship
 - Training
3. **Conducting a pilot**
4. **Test and evaluation**
5. **Roll out to production**

Initiation and planning

To gain the maximum benefit from the HP UPD:

- Fully understand your printing requirements and environment.
- Develop an HP UPD deployment strategy.

NOTE: An HP UPD deployment requires major changes to your IT environment and should be treated accordingly. Make sure you back up your print servers and print queues before beginning any installation.

Understand your printing requirements and environment

Determine deployment objectives

This is a description of the objectives of the deployment. The intent is to get a clear and detailed picture of what the end result will be after the migration or upgrade. See [HP UPD deployment worksheet](#) in Appendix E for details

Print servers or Direct IP

With improvements in desktop computing power, available printing management tools, and the growing concerns around reducing printing management costs, some enterprise customers are starting to question whether they should move to Direct IP printing or continue with client-server printing.

For additional information on whether direct IP printing is right for you refer to *Direct IP Printing with the HP Universal Print Driver* available on www.hp.com/go/upd . HP UPD supports either environment.

Identify stakeholders

The stakeholders are anyone impacted by the plan, and can include, but are not limited to the following groups.

- End users
 - Will there be downtime, what will change?
- IT staff
 - How much time and resources?
- Help Desk
 - What do they need to know?

Make an inventory

You must inventory all printing products, print servers, print queue names, printer drivers, IP addresses, and page description languages (PDLs) that you are using. If you have print servers, you also need to determine if all of the print queues are still active.

Consider PDL needs

Some business applications rely on a specific version of Printer Command Language (PCL) or require Adobe® PostScript®. As a result, test that the applications and solutions you are using are compatible with the HP UPD versions of PCL and postscript emulation.

If your testing proves that some applications or solutions are not compatible with the HP UPD versions of PCL and postscript emulation, you should retain the current drivers and queues for the non-compatible applications and solutions. Some possibilities include the following:

- Specialty products
- Specific business applications, such as ERP
- The use of certified drivers, such as SAP
- Line printers
- Large format printing products
- HP products that feature edge-to-edge printing, which require product-specific drivers

Driver considerations

Please consider the following to determine if the HP UPD is the correct solution for your printing environment.

- The HP UPD is supported and tested on HP printers only. For non-HP products, HP recommends using the driver supplied by the product manufacturer.
- Not all HP printers are supported by the HP UPD. The HP UPD supports most workgroup class HP LaserJet printers and MFPs, and a number of business Inkjet and Officejet printers. Some personal HP LaserJet and Inkjet printers are not supported. For the most current list of HP UPD supported products, see **Supported products** on the following Web site www.hp.com/go/upd.

Pre-configuration, policy and access requirements

If you plan on setting up custom default settings, or restricting access to printers or printer capabilities like color printing, now is the time to make a list of all those requirements.

Environment and network compatibility

Validate that the HP UPD is compatible with your current environment and network communication protocols. Make sure that the SNMP and mDNS protocols are not being filtered or blocked. The HP UPD requires these protocols for discovery and communication with products. See [HP UPD deployment worksheet](#) in Appendix E to make sure the HP UPD will work in your environment

Baseline the system

Test that all your applications (shrink wrapped and home-grown) are compatible with the HP UPD. Run performance and printing tests using “typical” documents.

Risk management

As with most projects, there are risks involved. Spend some time identifying these and how to mitigate any that might be serious. Some suggestions are:

- Make a backup of all systems before making any modifications.
- Thoroughly test before going into production.
- Plan your activities for a time of low print server usage to minimize user impact.
- When migrating to a new server, keep the old server operational for a period of time just in case you need to fall back to it.
- Do initial testing on a test server before moving to a production server.

Key deployment decisions

- Create a list of required drivers
- Choose an installation method
- Determine Driver Pre-Configuration needs
- Choose traditional and dynamic mode
- Decide whether to manage the HP UPD with Active Directory Group Policy
- Estimate time requirements

Create a list of required drivers

- HP UPD PDLs
- Product specific drivers
- Non-HP products

Choose an installation method

HP UPD can be installed using multiple methods including:

- Add Printer Wizard
- INSTALL.EXE
- HP Web Jetadmin
- Microsoft Print Management Console
- Custom scripts using Microsoft-approved tools
- HP PARK tools

Note that there are pre-configuration implications.

See [HP UPD deployment flowcharts](#) in Appendix F for additional guidance on which installation option is best for your environment.

Determine Driver Pre-Configuration needs

The default settings of the HP UPD can be changed to suit specific needs. For example, the administrator might want to set duplex printing, and print in grayscale as the defaults. This can be done on a per installation, per user, per group, or per site basis. For more information, see [Managing the HP UPD with Active Directory Group Policy](#) (chapter 8), the HP Driver Configuration Utility documentation, or by referring to the list of installation options in [Installation methods and environments](#) in chapter 5.

Choose traditional and dynamic mode

The HP Universal Print Driver (HP UPD) can operate in two different modes, traditional or dynamic.

- **Traditional mode** functions like the product-specific drivers. When installed in traditional mode, the HP UPD is associated with a specific printing product, which can then be selected from the application print menu. Once selected, the HP UPD user interface is similar in appearance to a traditional, product specific driver.
- **Dynamic mode** allows the user to find printers on a network. This is ideal when traveling or printing to a new product in the office. An easy-to-use interface helps users connect to HP printing products on their own. There are four methods for finding printers in dynamic mode: recently used printers, manually enter printer address, managed printer lists, or search options.

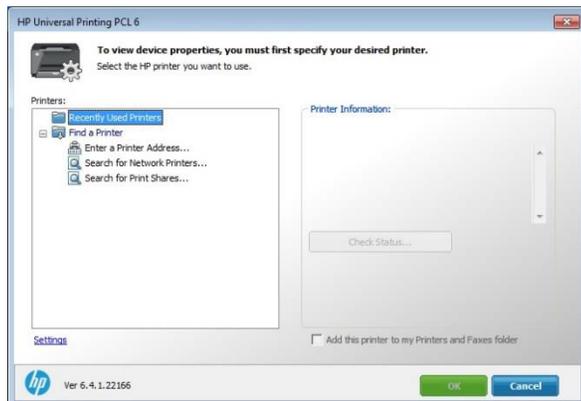


Figure 3-1 Dynamic Mode Print Interface

NOTE: For Windows 8/8.1 and later Windows operating systems, Dynamic mode is only supported in Windows desktop applications.

Dynamic mode and traditional mode are not mutually-exclusive. You can deploy print queues using traditional mode and also deploy the HP UPD using dynamic mode for mobile users.

For more information about traditional and dynamic mode, see [Installation methods and environments](#) in chapter 5.

Decide whether to manage the HP UPD with Active Directory Group Policy

Active Directory Administrator Templates provides options for managing the HP UPD in your environment. The HP UPD has capabilities and features that can be managed and controlled on a per-user or group level. This means that features like Use Mode settings, Color Access Control, Search Capabilities, and more can be managed down to the user level, or at a group level.

For more information about the Active Directory Administrator Templates, see the chapter on [Managing the HP UPD with Active Directory Group Policy](#) (chapter 8).

Estimate time requirements

Make sure that you allow sufficient time to complete all of the steps. The following are some things to consider.

- Planning
- Performing System Backups
- Gathering tools and/or write scripts
- Server Installation
- Client Installation
- Testing

The amount of time it will take to install the HP UPD depends on a number of factors including the number of drivers, the number of print queues on the server, and the number of host clients receiving the installation either PnP vended or through HP UPD INSTALL.EXE or Add Printer Wizard. The installation of any driver can be significantly slower if there are other printer drivers on the system.

The amount of time to create a print queue using an existing driver depends on processor speed, etc. However, if you have 1000 print queues to create, this could easily add up to between 8 and 16 hours.

Communication and training

HP strongly suggests having a communication plan in place prior to beginning your deployment of the HP UPD. This helps overcome objections and ease the fears of end-users who might be worried about losing some of their printing functionality. Make sure your end-users and the IT staff members understand the benefits gained by using the HP UPD.

Training

Develop training reference materials and identify resources to help your end-users successfully transition to the HP UPD from standard product drivers. For example, a change from the traditional mode printing user interface to the dynamic mode interface requires planning and in some cases simple training. Include information about how to identify products through the HP UPD. Employ a survey to gauge customer satisfaction.

Conduct a pilot test environment

HP recommends that you create a test environment during your HP UPD implementation. Select a part of your printing environment that will not affect many users to test the implementation prior to deploying to the entire printing environment. Make sure this test environment (applications and printers) is representative of the overall printing environment.

Testing and Evaluation

- Measure against the performance baselines
- Determine variances and if they warrant corrective action or a change
- Make any necessary entries into the configuration management log

Deploy to production

HP strongly recommends a phased approach to deploying the HP UPD.

Deploying in a phased manner across the IT environments helps to:

- Minimize issues and provide valuable information about each type of environment.
- Uncover issues that could be documented and considered prior to the next phase.
- Increase the confidence of end-users and sponsors in the project.

Closing the project

- Confirm work is done to requirements
- Gain formal acceptance of the product
- Hand off the completed product

4 Pre-configuring default settings and print policy for HP UPD

Introduction

This chapter outlines several options for configuring the default behavior of the HP UPD. The options vary based on the installation method selected. Review each option to determine which method is right for your environment. You can pre-configure the HP UPD default settings before, during, or after driver installation.

NOTE: In order to prevent any network traffic from a HP UPD driver to the LDAP server, printer status notification must be disabled. Printer status notification is no longer available starting with the release of HP UPD 6.5.0.

The table at the end of this chapter, [Configurable functions and pre-configuration utilities](#), lists the available settings for each pre-configuration utility and installation method. This chapter provides some representative examples, but is not a comprehensive list of available settings. The information in this chapter will help you select an option that best meets your needs.

In addition to the default driver settings, you can also create a print policy using the available tools to limit access to certain print features such as restricting printing after a specific time or not allowing color printing.

The following sections explain the methods available for configuring the HP UPD default settings and creating a print policy:

- [HP Print Administrator's Resource Kit \(HP PARK\)](#)
- [Configure HP UPD default settings using INSTALL.EXE during driver installation](#)
- [Configure HP UPD default settings and/or print policy using Group Policy Objects in Active Directory](#)
- [Pre-configure HP UPD default settings using HP Driver Configuration Utility](#)
- [Pre-configure HP UPD default settings using HP Driver Deployment Utility](#)
- [Configure HP UPD default settings after driver installation in driver preferences](#)
- [Overview of configurable functions and pre-configuration utilities](#)

HP Print Administrator Resource Kit (HP PARK)

The HP Printer Administrator Resource Kit (HP PARK) is a collection of tools, scripts and documentation to help print administrators install, deploy, configure and manage the HP Universal Print Driver (UPD). In the single file download, the HP PARK contains both supported and unsupported software tools, scripts and documentation.

Supported tools

The following tools provided within the HP Print Administrators Resource Kit are eligible for HP technical support.

- **Active Directory Administrator Template for UPD:** Allows administrators to manage the HP Universal Print Driver user policies and printer lists from within the Active Directory infrastructure. Add this AD Administrator Template into an existing Group Policy Object and assign the GPO to a user, group, or organizational unit to manage the HP UPD Managed Print Policies and Managed Printer Lists.
 - For more information on using AD templates, see [Managing the HP UPD with Active Directory Group Policy](#) (chapter 8).
 - Also see the You-Tube video “Using HP Active Directory Administrator Templates” at: <http://youtu.be/UUN2sEggnuc>.

NOTE: When using an AD template, if you open an application’s print dialog after initially connecting to the queue and without ever opening printing preferences or printer properties, the application’s print dialog may not reflect the policy depending on how the application is accessing devmode and which devmode it is accessing. However, it should print correctly based on the policy. To update the application’s print dialog, you need to access the print driver by opening printer properties or printing preferences through the application or printers folder.

- **AutoUpgradeUPD:** Simplifies the process of creating clean print queues on a print server. This is useful when upgrading the HP UPD driver version, upgrading an older non-UPD print queue to use the HP UPD, or resetting existing print queues to factory or preconfigured installation defaults. This tool prevents existing queues from carrying forward unknown, incompatible and unstable configurations during driver upgrade.

NOTE: There are separate versions of AutoUpgradeUPD for 32-bit and 64-bit operating systems. AutoUpgradeUPD.exe is for 32-bit operating systems and AutoUpgradeUPD64.exe is for 64-bit operating systems.

- For more information on using HP AutoUpgradeUPD, see [Delete and recreate queues with AutoUpgradeUPD.exe](#) in chapter 6.
- Also see the You-Tube video “HP AutoUpgradeUPD” at: <http://youtu.be/mYCVx1RBp9w>.
- **Driver Configuration Utility (DCU):** Is a small Windows application used to edit the configuration file associated with a particular driver. The configuration file defines the default printer settings for the driver applied at the time of installation. The settings defined within the DCU take effect when the printer is installed.

NOTE: The HP DCU works with HP printer drivers that are configured using a .cfg file such as the HP v3 UPD.

- For more information on using DCU, see Pre-configure HP UPD default settings using HP Driver Configuration Utility (HP DCU) in this chapter.
- Also see the You-Tube video “Pre-configuring HP UPD using the HP DCU at: <http://youtu.be/4jx1jBXrVUU>.
- **Driver Deployment Utility:** Is a Windows application that packages the driver files and code needed to deploy them into an *.EXE and *.CAB file. These files are run on a client PC to copy the driver files to the Windows driver store, and for network packages, to install the printer.

NOTE: The HP DDU works with HP printer drivers that can be installed by an .INF file that supports only a single platform (32-bit or 64-bit) such as the HP v3 UPD.

- For more information on using DDU, see [Pre-configure HP UPD default settings using HP Driver Deployment Utility](#) in this chapter.
- **PRNCON.EXE:** Is a console application for removing and adding an HP network printer's point-and-print connection between a Windows client workstation and a print server.

Unsupported Tools

The following tools provided within the HP Print Administrators Resource Kit are not HP supported. These are provided as a resource to customers. If you have any questions, comments, or enhancement requests regarding these unsupported tools, email HP at UPD_PARK@hp.com. Responses will be at HP's discretion, and response times are not under a service level agreement and may vary. Documentation available from the download site for the software contains additional information related to support.

- **Add Print Model to Comments Field:** This script is used to add the device model name to the comments field for any print queue that is using the HP Universal Print Driver (HP UPD).
- **HPPRLOG:** Captures print registry information to *.xml and *.hiv files. Run `hpprlog*.exe` on the print server, the active node of a print cluster, or a Citrix server.
- **Migrate Server Tools:** A set of scripts and other tools to assist in automating the migration of print queues from an old server to a new server or to upgrade the print queues on a server.
- **UpdateNow:** A command line utility designed to trigger the automatic configuration functionality in HP printer drivers. This enables print administrators to script the automatic configuration of devices using a single command that will be consistent across multiple versions of HP printer drivers.
- **RemovePlugPlayDrivers:** This utility searches for HP plug and play printer driver files in the Windows driver store and provides an option to remove these staged printer driver files. Currently installed printers are unaffected by this utility. The benefit provided is version control of the HP print driver utilized for software first USB Plug and Play installation of newly created HP UPD printers in the **Devices and Printers** folder.
 - For more information, see the You-Tube video Staging Drivers for PNP using HP RemovePNPDrivers Utility http://youtu.be/XZ2SvUuR_3c

See the release notes for each tool for the latest information on the tool and steps for using it.

Configure HP UPD default settings using INSTALL.EXE during driver installation

The HP UPD installer allows some driver default settings to be modified via command line options. Some of these switches will change the system-wide behavior of the HP UPD, while other changes are specific to a single print queue.

A list of the available options for the INSTALL.EXE utility can be displayed by entering **install /?** from the command prompt in the HP UPD driver folder.

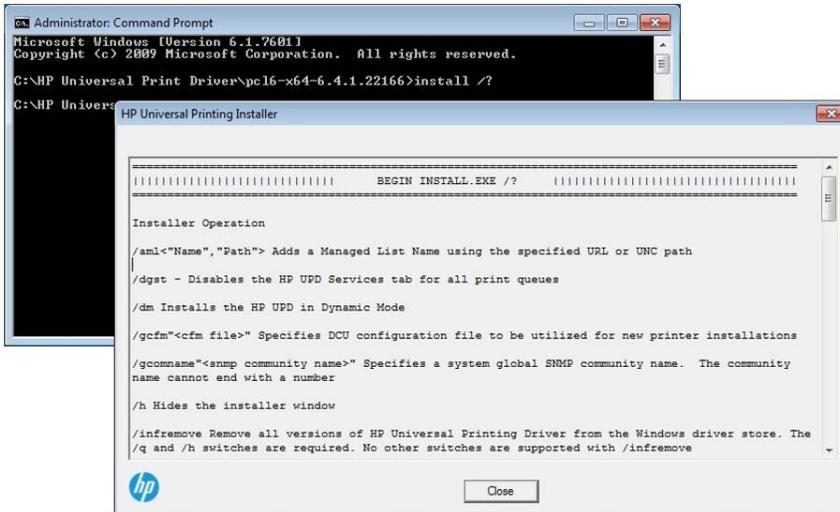


Figure 4-1 Install.exe Help Dialog

The screen that displays is a comprehensive list of the available configuration options that are available during installation of the HP UPD. Some of the more popular install switches include the following:

- /q – Quiet mode, no prompt
- /h – Hides the HP install dialogue
- /sm – Creates a static printer instance (i.e. Traditional Mode) and port
- /n – Creates the printer with the defined printer name

Multiple switches can be combined to create a command-line installation that is customized to meet your requirements.

For additional information, see [Method 3: Windows client/server: Use command prompt \(INSTALL.EXE with switches\)](#) in chapter 5.

The default settings are changed to reflect the chosen options in each of the printers installed using these switches.

Configure HP UPD default settings and/or print policy using Group Policy Objects in Active Directory

The changes made within Group Policy Objects control the global HP UPD user capabilities. An HP UPD Administrator Template can be added to create a Group Policy Object to manage the user HP UPD capabilities. The settings apply to any queue that uses the HP UPD. Care should be taken when locking configuration settings. The user is unable to change a locked setting. As an example, if duplex is enabled and locked, the user will be unable to override this to print transparencies.

The HP UPD Administrator Template is included with the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language, and then select your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

NOTE: See [Managing the HP UPD with Active Directory Group Policy](#) in chapter 8 for detailed information on installing and using the Active Directory Administrator Template.

The following are typical settings available for pre-configuration and are located in the **Default Print Settings** section of the HP UPD AD Administrator Templates:

- Duplex
- Grayscale
- Economode
- Job Storage
- Edgeline QAC
- Print Quality

The HP UPD policy management capabilities are disabled by default. To take advantage of the management capabilities through the Group Policy Objects on new and existing queues, the HP UPD management capabilities must be enabled.

NOTE: When using an AD template, if you open an application's print dialog after initially connecting to the queue and without ever opening printing preferences or printer properties, the application's print dialog may not reflect the policy depending on how the application is accessing devmode and which devmode it is accessing. However, it should print correctly based on the policy. To update the application's print dialog, you need to access the print driver by opening printer properties or printing preferences through the application or printers folder.

You-Tube Video

For more information on using AD templates, see the You-Tube video "Using HP Active Directory Administrator Templates" at <http://youtu.be/UUN2sEggnuc>.

Pre-configure HP UPD default settings using the HP Driver Configuration Utility

The HP Driver Configuration Utility (HP DCU) is a Windows application used to edit the configuration file associated with a particular print driver. The configuration file controls the print driver settings and takes effect when the driver is installed.

NOTE: Windows requires a user to have Administrator rights to install a printer driver.

The HP DCU does not handle any part of the deployment or installation of the driver. Rather, the default configuration file is modified and saved back to the same driver directory in which it was opened (hpcpu*.cf*) or saved to the local host's directory (filename.cfm). The HP Driver Configuration Editor is intended for use in environments where there is an established process for deploying drivers.

CAUTION: Changing the configuration file of the driver with this utility and saving it as a ".cfg" file will invalidate the digital signature (WHQL) if the ".cfg" file in the driver is replaced with this customized ".cfg" file. Instead, save the file as a ".cfm" file. Saving the changes as a ".cfm" file will maintain the digital signature.

On Windows 7, if you attempt to install a version of the HP UPD with an invalidate digital signature (WHQL) and a version of the HP UPD is already installed with a valid digital signature, Windows 7 may ignore the invalid driver, and use the current valid driver instead. Since the pre-configuration settings are tied to the new driver, the settings are not updated.

Network administrators can use HP DCU to pre-configure a print driver before deploying and installing. It is most beneficial when configuring print drivers for multiple workstations or print servers for print queues that share the same configuration. Since the driver is not pointing to a specific device at this point, the available settings in HP DCU are based on settings available in the driver and not a specific device. If you are pre-configuring the HP UPD, additional trays may be shown, as well as color-related settings such as Grayscale. If the actual device does not support a specific setting in HP DCU, the setting is ignored. For example, if you enable Grayscale and then connect to a monochrome printer, the Grayscale setting is ignored.

NOTE: The HP DCU works with HP printer drivers that are configured using a .cfg file such as the HP v3 UPD.

Pre-configure the HP UPD using HP DCU

The process of configuring drivers and other software occurs before installation. This allows the driver to be configured once and installed on any number of server or client systems.

Use the following steps to pre-configure the HP UPD:

1. Open the directory for the HP Driver Configuration Utility (HP DCU) in the HP PARK directory.

NOTE: The HP DCU is included with the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language and select your product's operating system (such as Microsoft Windows 7 32-bit or 64-bit). Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

HP DCU is supported on both 32-bit and 64-bit systems.

2. Double-click HPBCFGAP.EXE to run the HP Driver Configuration Utility ..

NOTE: The application automatically opens in the language specified within Region and Languages.

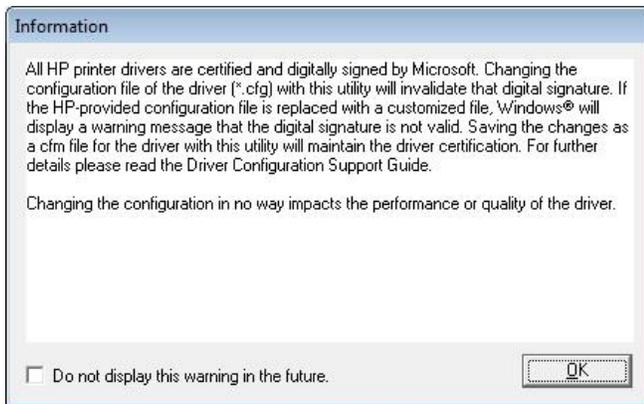


Figure 4-2 Digital Signature Not Found dialog box

The Information dialog box appears warning users that, depending on how the driver is installed, a Windows Hardware Quality Labs (WHQL) Digital Signature Warning will appear. Changing the configuration of the driver does not impact the performance or quality of the driver. Changing the configuration may invalidate the driver's digital signature and triggers the appearance of this dialog box.

3. Click **OK**
4. Click **File** and then **Open**
5. Open a driver configuration file (cfg) or an existing cfm file (such as HPCPU210.CFG for the HP UPD 6.5.0 PCL 6 driver)

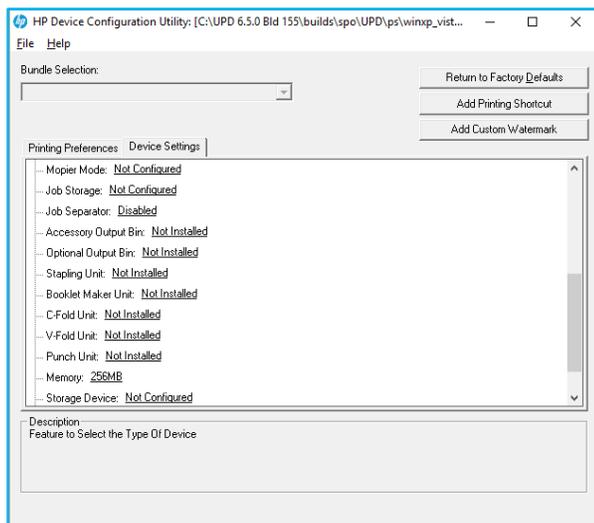


Figure 4-3 HP Driver Configuration Utility (DCU)

NOTE: With DCU 1.650.1.32821/UPD 6.5.0 and later, Mopier Mode, Job Storage and Storage Device settings are now set to Not Configured so that if set to Installed, these settings are set in the registry. In the past, Mopier Mode, Job Storage and Storage Device defaulted to Installed. Since they did not change if left to Installed, the cfm file from DCU did not set these settings. Prior to this change, if the queue is not pointing at an actual device with Bidi enabled, settings such as Mopier would be disabled.

6. Modify settings to your requirements.
7. Save the changes.

File-Save As: Allows you to select the file name and extension. If only a file name is entered, the application saves the file as (filename).cfg to the defined directory. In order to save the file as a .cfm, you must type the extension .cfm after the file name.

NOTE: File-Save: Saves the file to the same filename from where it was opened, which may impact the digital signature. To not impact the digital signature, HP recommends using **File-Save As** and saving the file as a .cfm file.

8. Copy the cfm file to the ..\3 folder.

- 64 bit Windows- C:\Windows\system32\spool\drivers\x64\3
- 32 bit Windows- C:\Windows\system\spool\drivers\w32x86\3

NOTE: When copying the cfm file to the local machine driver directory, the cfm file name must have the format hpcpuxxx.cfm, where xxx matches the number of the cfg file. For example, hpcpu195.cfg would be named hpcpu195.cfm.

When using UPD 5.5.0 or later, you can use any file name, as long as it uses the extension .cfm, and the install.exe is used with the /gcfm option to install the printer. For example:
install.exe /gcfm"c:\temp\duplex.cfm" /n"PrinterName" /sm"HostName"

9. Install the driver using the supported method of deployment.

HP DCU provides the most comprehensive list of configurable options and settings, but it does not include all of the available options. In some cases, the HP DCU is the only method to configure a specific driver setting. It might become necessary to combine some of the pre-configuration tools to get a completely configured driver for your environment. Please refer to the *Driver Configuration Support Guide* for additional information on using the HP DCU.

For more information on the HP PARK in this document, see [HP Print Administrator's Resource Kit \(PARK\)](#) in this chapter.

You-Tube Video

For more information on using DCU, see the You-Tube video "Pre-configuring HP UPD using the HP DCU" at: <http://youtu.be/4jx1jBXRvUU>.

Pre-configure HP UPD default settings using HP Driver Deployment Utility

The HP Driver Deployment Utility (HP DDU) simplifies the deployment of printer drivers on client computers. It is a simple utility that packages the driver files and the code needed to deploy them into an *.EXE and *.CAB file. These files are run on the client PC to copy the driver files to the Windows Driver Store and for network packages, to install the printer.

NOTE: Windows requires a user to have administrator rights to install a printer driver.

The HP Driver Deployment Utility works with printer drivers that can be installed using an .INF file, supporting only traditional mode installation (dynamic mode is not supported). It is designed to work with printer drivers that have their files contained in one directory structure. Because this utility is generic, it does not have knowledge of how specific drivers are packaged. It packages all files in the directory (and subdirectories) where the driver INF file was found. The driver must be expanded so that the HP DDU can process the INF files. If you download an .exe with the driver files, you need to run it first to unpack all of the files. Then run the HP DDU to package the files for deployment on the client system.

NOTE: The HP DDU works with HP printer drivers that can be installed using an .INF file that supports only a single platform (32-bit or 64-bit) such as the HP v3 UPD.

The HP DDU is used to pre-configure a print driver for deployment. When the package is run on the client computer, the new configuration file configures the print driver after it is installed, and does not interfere with WHQL certification. The HP DDU contains the standalone HP DCU utility inside the package and is launched when **Pre-configure driver** is selected from the HP DDU tool.

Pre-configure the HP UPD using HP DDU

1. Open the directory for the **Driver Deployment Utility** in the HP PARK directory.

NOTE: The HP DDU is included with the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language and select your product's operating system (such as Microsoft Windows 7 32-bit or 64-bit). Scroll down and click **Software – Universal Print Driver**. Click **Download** for the HP Printer Administrator Resource Kit. Save the file and then double-click the file and click **Extract all files**.

HP DDU is supported on both 32-bit and 64-bit systems.

2. Copy the contents of the Driver Deployment Utility directory to the desired directory on the hard drive of the client computer where HP UPD and/or device-specific print drivers will be preconfigured.
3. Double click HPBDDU.EXE to create the package.

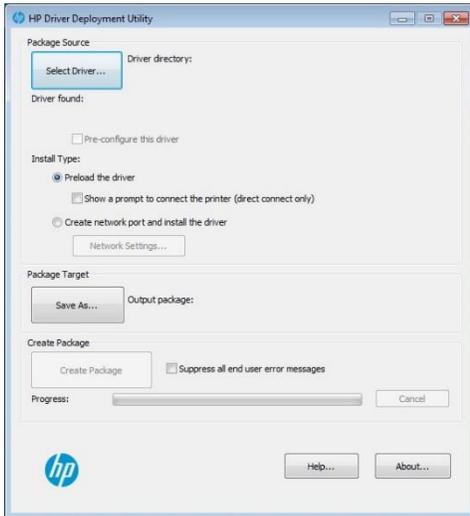


Figure 4-4 HP Driver Deployment Utility (DDU)

4. From Package Source section, click **Select Driver...** and select the driver to package by browsing to an INF file in the driver directory.
5. Select the **Pre-configure this driver** checkbox. This checkbox is enabled only for drivers that support pre-configuration.
6. When the dialog appears to “Select the corresponding CFG to the selected driver,” click **OK**
7. Select the CFG file (for example, hpcpu210.cfg for the HP UPD 6.5.0 PCL 6 driver) and click **Open**
8. For direct connect, select **Preload the driver**
 - Select the **Show a prompt to connect the printer** checkbox if you want to prompt the user after the files are copied
9. When deploying network printers, select **Create network port and install the driver.**
 - Click **Network Settings...** to enter the network settings.

- From the **Required Settings** section, enter at least one way of identifying the printer (IP address, Hardware address, or Hostname).
 - Make any changes to the **Additional Settings** section (port name, printer name, default printer, sharing and share name). You can leave the default settings if you don't need to make changes.
 - Click **OK**.
10. From Package Target section, click **Save As...**
 11. Select a location where you want the files saved and click **Save**
 - Three files will be written here: an .exe, a .cab and an .xml with information about the package created
 12. If you want to suppress any error messages, from the Create Package section, select the **Suppress all end user error messages** checkbox .
 13. Click **Create Package**. The Driver Configuration dialog opens.
 14. Configure the driver as needed.
 15. When you are finished configuring the driver, click **OK**. After accepting the configuration changes, the package will be created.

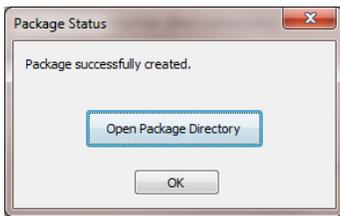


Figure 4-5 Package Status

16. Click **OK**.
17. Run the new .exe from the client machine. You must have administrator rights to run the exe because it will be copying files into the Windows driver store.
 - For direct connect, the driver files are on the system and any user can connect a printer to trigger the plug and play event. The printer object is not created until the printer is connected.

NOTE: If you load multiple pdls for one printer, the OS will determine which one satisfies the Plug and Play event. The OS will create one printer object for that pdl.

- For network printers, a port and printer object will be created with the information provided above.

For more information on the HP PARK in this document, see [HP Print Administrator's Resource Kit \(PARK\)](#) in this chapter.

Configure HP UPD default settings after driver installation in driver preferences

Table 4-1 Configurable functions and pre-configuration utilities lists which utility or utilities to use to configure commonly used printer driver features.

Manage printer default settings

When a printer gets installed, certain default settings are automatically set based on what capabilities are available from the product. These default settings include items such as default paper size and type, simplex (single sided printing), and portrait or landscape printing.

In many printing environments it is common for printing administrators to change the default settings. Some of the more common changes are to enable printing on both sides of the paper (duplex) and to print in grayscale. There are many ways to change or preconfigure these default settings and some are discussed in other chapters of this HP System Administrator's Guide.

This section primarily discusses how these new default settings are deployed and how to manage or provide firmer controls on changes allowed to these default settings. Default settings and changes are not managed.

Other sections in this chapter describe the use and procedures for changing the default settings in both Point and Print and Direct IP Printing environments. Please refer to the sections on HP DCU, HP DDU, and INSTALL.EXE for specific instructions on how to use these tools.

It is important to understand that changes to the printing default settings are at most temporary and basically not managed. Users have the ability in both Direct IP Printing and Point and Print environments to change the default settings on their printers through the **Printing preferences**. In some cases, depending on company policies, a centralized management approach is necessary to ensure that the default settings are not changed.

Manage default settings with Active Directory Group Policy for HP UPD in dynamic or traditional mode

The HP Active Directory Group Policy offers another way to ensure that the default settings are maintained and managed. HP's solution for printer policy settings using an existing Active Directory environment is to use the Active Directory group policy objects. This allows an administrator to set defaults for settings such as duplex, and grayscale printing. These policies are pushed locally into the users registry and referred to during printing. This has the effect of constantly refreshing the user's default settings so each time a user prints, the correct default settings are present. Policies are pushed to the client PCs. This has the effect of refreshing the default printer settings automatically.

Please refer to the sections on using Active Directory Administrator Templates for further information (chapter 8).

NOTE: When using an AD template, if you open an application's print dialog after initially connecting to the queue and without ever opening printing preferences or printer properties, the application's print dialog may not reflect the policy depending on how the application is accessing devmode and which devmode it is accessing. However, it should print correctly based on the policy. To update the application's print dialog, you need to access the print driver by opening printer properties or printing preferences through the application or printers folder.

You-Tube Video

For more information on using AD templates, see the You-Tube video "Using HP Active Directory Administrator Templates" at <http://youtu.be/UUN2sEggnuc>.

Overview of configurable functions and pre-configuration utilities

The table below shows which utility or utilities can be used to configure several commonly-used driver features. In some cases, more than one method will need to be used depending on the combination of settings that are to be changed. For example, to enable policy management and set the **Watermarks** to **Username**, use the INSTALL.EXE utility to enable policy management and the HP DCU tool to set the default Watermark option.

Table 4-1 Configurable functions and pre-configuration utilities

Function	INSTALL.EXE	AD	HP DCU	HP DDU
Print on Both Sides (Duplex) (lock)		X	X	X
Orientation			X	X
Print in Grayscale (lock)		X	X	X
Print Quality		X	X	X
Color Options (lock)			X	X
EconoMode (lock)		X	X	X
Paper Size			X	X
Media Type (lock)			X	X
Paper Source (lock)			X	X
Job Storage Mode (lock)		X	X	X
Punching			X	X
Fold *			X	X
Stapling / Folding			X	X
Output Bin			X	X
Services Tab	X	X	X	X
Printing Shortcuts			X	X
TrueType Font			X	X
HPEasyColor			X	X
Pages per Sheet			X	X
Booklet Printing			X	X
Send True Type As Bitmap			X	X
Print all Text as Black			X	X
Raster Compression			X	X
Print Document On			X	X
Scale to Fit			X	X
Percent of Normal Size			X	X
Watermarks (lock)			X	X
Copies			X	X
Collate			X	X
Mirror Output			X	X
PostScript Language Level			X	X
Device Type (lock)			X	X
Tray 1-10			X	X

Function	INSTALL.EXE	AD	HP DCU	HP DDU
Mopier Mode			X	X
Job Storage			X	X
Job Separator			X	X
Accessory Output Bin			X	X
C-Fold Unit *			X	X
V-Fold Unit *			X	X
Memory			X	X
Optional Output Bin *			X	X
Storage Device			X	X
Automatic Configuration			X	X
Edgeline QAC		X		
Color Access Control		X		
Enable Policy mgmt	X			

* Requires DCU v1.640.1.32746 or later, or DDU 2.0.0.32755 or later, with HP UPD 6.4.1 or later

5 Installing and uninstalling the HP UPD

Introduction

This chapter contains the following sections:

- [Install HP UPD v5.1 and later](#)
- [Download and unzip the HP UPD installation files](#)
- [Installation methods and environments](#)
- [Uninstall the HP UPD](#)

The mode used to install the HP UPD determines the HP UPD user experience and also influences the extent of HP UPD management.

- **Traditional mode**

An HP UPD installed in Traditional mode behaves like a product specific driver. During installation, the driver is associated to a specific printer, creating a permanent instance of the driver.

- **Dynamic mode**

An HP UPD installed in Dynamic mode allows the most flexibility. A user can find and print to any supported HP product within any network or print environment without installing a product-specific driver. The HP UPD discovers the product capabilities so that users can print using most product capabilities, including advanced printing options such as watermarks and booklet printing.

NOTE: For Windows 8/8.1 and later Windows operating systems, Dynamic mode is only supported in Windows desktop applications.

Creating a permanent instance makes the printer appear (in the UI) more like a traditional print driver but its features can still be updated dynamically. This also reduces the number of mouse clicks a user goes through when selecting a printer that is used often.

The following information provides detailed instructions for installing the HP UPD in either traditional or dynamic mode, along with instructions on how to remove the HP UPD.

Supported modifications of the HP Universal Print Driver

- The HP UPD must be installed exactly as it was received from HP, with no modifications except as provided by HP-supplied utilities such as HP DCU, HP DDU, or HP Web Jetadmin. No other driver modifications are supported.
- The HP UPD must be installed using the HP-supplied installer (INSTALL.EXE) or using Microsoft recommended and HP-approved tools and/or process listed in [Installation methods and environments](#) in this chapter. The use of any other tool or method must be approved by HP in writing to be considered a supported installation method.
- Any modifications to any HP UPD driver files (.INF, .MSI, etc.), making registry edits after installation, or manually copying or deleting files, except when explicitly instructed to do so by HP in writing, will result in an unsupported configuration.
- The HP UPD should be deleted using only Microsoft-supplied tools and procedures. Manual deleting of registry entries and/or driver files is not recommended and not supported. See [Uninstall the HP UPD](#) in this chapter for more information.

Install HP UPD v5.1 and later

Use this section to install or upgrade HP UPD v5.1 or later.

Determine the HP UPD version installed

To determine if the HP UPD is already installed, open the **Printers** folders using one of the following methods:

Command Line: From a command prompt (**Start**→**Run**, type `cmd`, and then press **Enter**) type the following command to open the Printers folder: `control printers`

User Interface: This is dependent on the operating system version. For Windows 7, click **Start** and then click **Devices and Printers**.

Right mouse click on the printer (print queue) and then select **Printer properties**.

- For an HP UPD dynamic mode installation, the HP UPD version displays on the lower left.
 - To see the `unidrv.dll` or `pscript5.dll` versions, select a printer in the dynamic U/I, click **OK** and select the **About** tab. The HP UPD version displays at the top. The `unidrv.dll` and `pscript5.dll` versions are listed under **Driver Files**.
- For an HP UPD traditional mode installation, select the **About** tab. The HP UPD version displays at the top. The `unidrv.dll` and `pscript5.dll` versions are listed under **Driver Files**.

Microsoft Windows Driver Architecture

The HP UPD PCL 6 driver is dependent on the Microsoft Windows Unidriver (`unidrv.dll`) architecture. The HP UPD PS driver is dependent on the Microsoft `pscript5.dll`. The HP UPD release notes provide the `unidrv.dll` and `pscript5.dll` version used by HP for internal testing and subsequently qualified by Microsoft's WHQL test process. The Microsoft WHQL certification gives the HP UPD the Certified for Windows logotype. The HP UPD is supported by HP for all versions releases of `unidrv.dll` and `pscript5.dll` that remain under Microsoft's standard support. It is the expectation that Microsoft's updates and changes to `unidrv.dll` or `pscript5.dll` will be backward compatible in support of the Microsoft Windows® universal print driver architecture. Any unexpected behavior resulting from the dependency on the Microsoft `unidrv.dll` or `pscript5.dll` requiring code change to the HP UPD would become a candidate for fix in the next release of the HP UPD, and/or investigated with Microsoft, as required. The HP UPD installer is one of several possible distribution mechanisms for the shared `unidrv.dll` and `pscript5.dll` files.

The HP UPD includes the `unidrv.dll` and `pscript5.dll`. This means that the HP UPD installation package might update the `unidrv.dll` and `pscript5.dll` as necessary during install.

Before installation, it is advised to review this guide and the following Microsoft articles:

- **KB829766** — Mailbox and other printer specific settings are saved with an Excel file (<http://support.microsoft.com/kb/829766>).

See [Third-party articles and Windows printing information](#) in appendix C for additional articles.

Enterprise environments that have a unidrv.dll or pscript5.dll version earlier than the version packaged in the HP UPD might experience the symptoms defined in the Microsoft articles. Administrators should identify the unidrv.dll or pscript5.dll version installed on the target host's \windows\system32\spool\drivers* directory, compare it to the HP UPD Version History table in the HP UPD release notes, and create appropriate testing and deployment plans specific to their installation environment.

NOTE: To see what version of unidrv.dll and pscript5.dll files are on the system and compare them against the version you are about to install, see [Determine the HP UPD version installed](#) in this chapter.

HP UPD installation methods

HP UPD supports the following methods for new printer installation and driver upgrade. All methods support pre-configuration of the driver's settings using the HP Driver Configuration Utility (HP DCU) functionality.

HP UPD's INSTALL.EXE: This method can be used for traditional mode and dynamic mode installation. It is launched from the command line or a script and supports optional configuration switches executed during the installation process. Enter `install.exe /?` at the command prompt for a list of available options.

Microsoft Operating System: These methods can be used for installation in traditional mode. HP supports the following Microsoft methods for print driver install or upgrade of the HP UPD:

- **Add Print Wizard:** Accessible from **Printers** folder by selecting **Add a printer** — wizard based installation for new printer install.
- **Add Driver Wizard:** From the **Printers** folder select a printer name, select the **Print server properties** (Windows 7, Server 2008R2, Windows 8/8.1, Windows 10, Server 2012/2012R2, and Server 2016) and then select the **Drivers** tab. Methods available include:
 - **Add:** New driver installation, creating a new printer and adds driver version to the Microsoft driver store.
- **Print Management Console:** For Windows 7, Server 2008R2, Windows 8/8.1, Windows 10, Server 2012/2012R2, and Server 2016. From the **Control Panel** select **Administrative Tools** and then select **Print Management**. The Print Management Console enables you to install, view, and manage all of the printers in your organization. See Microsoft's documentation for more information.
- **PrintUI**—Allows common print administration tasks from a command prompt or script, including adding a new printer, delete existing printers, add or remove host connections.
- **pnputil**—Add or remove HP UPD from the driver store (use with Windows 7, Windows 8/8.1, Windows 10, Windows 2008 R2, Windows Server 2012/2012R2, and Windows Server 2016). Allows the addition of the driver to the driver store, but does not install the driver or create a printer. The advantage of adding the HP UPD to the driver store is to make it available for Plug and Play, USB connected devices, and enables users without administrator rights to create traditional print queues.

HP Driver Deployment Utility—This method can be used for installation in traditional mode. This utility packages pre-configured HP UPD installation files and the code needed to deploy them into an *.EXE and a *.CAB file. These files are run on the client PC to copy the driver files to the Windows driver store, and optionally, install the printer.

HP Web Jetadmin—This method can be used for installation in traditional mode. Administrators can create, edit, and delete printers and install or update print drivers by using the Print Management features in HP Web Jetadmin (see www.hp.com/go/wja for more information).

Point and Print—This method can be used for installation in traditional mode. The HP UPD can be vended from a server to clients connected to a shared printer, performing either a new printer install or driver upgrade.

NOTE: HP UPD also supports USB Plug and Play, which is not an installation method for the driver, but instead a method for an already installed print driver to create a new printer instance in the printer's folder.

Explanation of the driver name

During a new driver install, or when changing the driver version of an installed HP UPD printer, you can select either the version-specific option (for example HP Universal Printing PCL 6 (v6.3.0)), or the non-version-specific option (for example, HP Universal Printing PCL 6). These two choices are defined by HP and read directly from the driver hpcuxxxx.inf file. Selecting either option installs the same set of capabilities. The version-specific option is available so that you can install different driver versions on the same server (a v6.3.0 driver can coexist with a v5.9.0 driver). With HP UPD v5.5.0 and higher, you can also install different minor release versions. With earlier versions, this is not possible. For example, you cannot install a v5.2.5 driver and v5.2.6 driver on the same server, because these are the same major and minor release version (v5.2).

NOTE: Starting with HP UPD v5.5.0, the driver supports a major.minor.subminor release version. For HP UPD 5.4 and previous releases, a customer will not benefit from this change. With this change, you can install a HP UPD 6.2.0 driver and HP UPD 6.2.1 driver on the same server.

The installation option to select the version specific HP UPD driver name applies only to traditional mode installations. Implementation options include the following:

- `install.exe /tm` — Installs the non-version-specific driver.
- `install.exe /m "<UPD specific version>"/sm <port>` — Installs the specific version.
For example: `install.exe /m"HP Universal Printing PCL 6 (v5.2)"/sm"LPT1"`

NOTE: HP UPD v5.2.6 and earlier require that the full name and version are provided with the /m switch, as in the above example ("HP Universal Printing PCL 6 (v5.2)"). HP UPD v5.3 and later does not require the full name or version when using the /m switch.

- Add Printer Wizard — After selecting the HP UPD inf file, the GUI offers the choice between version specific the HP UPD and non-version-specific HP UPD.
- `printUI`—For example:

```
C:\rundll32 printui.dll, PrintUIEntry /if /b"printer1" /f hpcu190c.inf /r"lpt1:"  
/m"HP Universal Printing PCL 6"  
  
C:\rundll32 printui.dll, PrintUIEntry /if /b"printer2" /f hpcu190c.inf /r"lpt1:"  
/m"HP Universal Printing PCL 6 (v6.3.0)"
```

The first command installs a printer with the name printer 1 using the non-version-specific PCL 6 driver. The second command installs a printer called printer 2 using the version-specific PCL 6 driver.

HP UPD name selection

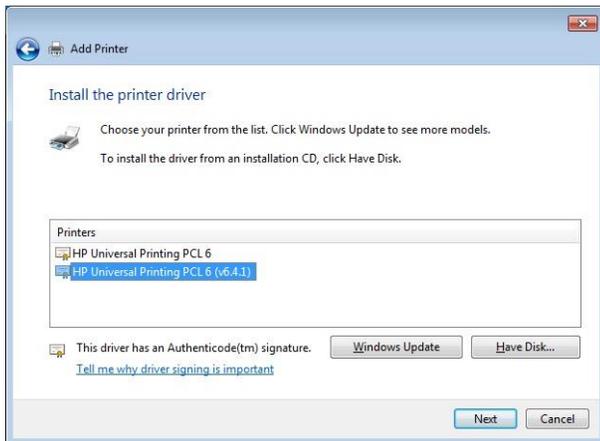


Figure 5-1 Selecting version specific driver in Add Printer Wizard

The first option, "HP Universal Printing PCL 6," refers to the non-version-specific HP UPD. Installing this option will install or upgrade all printers using the generic (non-version) of the HP UPD to the driver version being installed. For example, if HP UPD v5.8.0 is installed on the system as "HP Universal Printing PCL 6" and the administrator installs the HP UPD v5.9.0 PCL 6 selecting the non-version HP UPD during install, every printer using the driver name "HP Universal Printing PCL 6" will be upgraded.

The second option, "HP Universal Printing PCL 6 (vX.Y.Z)", referred to as the version-specific HP UPD, creates a version-specific driver name instance of the HP UPD. Selecting the version-specific driver name of the HP UPD does not upgrade the HP UPD printers that have a different driver version assigned to the printer. This allows a print server to have multiple driver versions of the HP UPD on a single system. For example, the following driver names could all be on the same host:

- HP Universal Printing PCL 6 (v6.3.0)
- HP Universal Printing PCL 6 (v5.8.0)
- HP Universal Printing PS (6.0.0)
- HP Universal Printing PS

NOTE: Maintenance releases — HP UPD v5.4 and earlier only display Major.Minor version numbers in the MODEL field, which becomes the printer model name. For example, "HP Universal Printing PCL 6 (v5.1)" displays in the MODEL field for v5.1.x of the HP UPD. If v5.1.0 is installed followed by an installation of v5.1.1, all printers on the print server using driver v5.1.0 would upgrade to v5.1.1. HP UPD v5.5.0 and later display Major.Minor.Subminor version numbers in the MODEL field, which becomes the print model name. For example, HP Universal Printing PCL 6 (v5.4.0). With this change, you can install a UPD 5.6.0 driver and UPD 5.6.5 driver on the same server.

After the installation of different driver versions, all installed drivers will use the same version of unidrv.dll and pscript5.dll (the latest version).

Printer name matches driver name—By default, the printer name will match the driver name defined in the hpcuxxxx.inf file. For example, both the driver name and the printer name of the HP UPD are "HP Universal Printing PCL 6 (v6.0.0)". HP recommends that administrator's change the printer's name to be different than the default installed driver name.

Identify the driver name for the HP UPD printer

Follow these steps to view the driver name for an installed printer:

1. From a command prompt (**Start**→**Run**, type cmd, and press enter). Then type the following command: control printers, and then press Enter.
2. Within the **Printers** folder, select the installed print queue, right mouse click, and then select either **Printer properties**.
 - For an HP UPD dynamic mode installation, select a printer, select **OK**, and then go to the **Advanced** tab. See the field to the right of "Driver:" for the installed driver's name.
 - For an HP UPD traditional mode installation, select the **Advanced** tab, see the field to the right of "Driver:" for the installed driver's name.

Download and unzip the HP UPD installation files

Before you begin the installation procedure, use the following steps to download and unzip the HP UPD installation files:

1. Go to the following Web site: www.hp.com/go/upd
2. Click **Download now**
3. Select the language, and then select your operating system.
4. Scroll down, click "+" to expand the list **Driver – Universal Printer Driver**.
5. Find the driver PDL you need in the table and then click **Download** and download the driver.
6. Click **Download** to the right of the HP UPD PDL you want to download the driver
7. Click **Save**
8. Unzip the HP UPD download file.
 - a. Double-click the downloaded file or click **Run**
 - b. Uncheck the box to the left of **When done unzipping open: \install.exe**.
 - c. Click the **Unzip** button.
 - d. When the unzip process completes, click **OK**, and then click **Close**.

Installation methods and environments

NOTE: Generally, procedures in this document represent the steps required when using Microsoft Windows 7. The steps for other Windows operating systems may differ slightly.

Install the HP UPD driver and create a printer instance by using one of the following methods:

- **Method 1: Windows client/server: Use Add Printer wizard**
- **Method 2: Windows client/server: Use INSTALL.EXE wizard**
- **Method 3: Windows client/server: Use command prompt (INSTALL.EXE with switches)**
- **Method 4: Windows client/server: Use Point and Print**
- **Method 5: Windows client/server: Use HP Web Jetadmin Print Queue Creation**
- **Method 6: Create a driver instance with plug and play**
- **Method 7: Other supported Microsoft driver installation methods**

- **Environment A: Windows Cluster server environment**
- **Environment B: Windows Terminal Server/Citrix XenApp environments**
- **Environment C: Novell**

NOTE: You must have Print Administrator rights to install a print driver.

Method 1: Windows client/server: Use Add Printer wizard

Follow these steps to install the HP UPD in **Traditional mode** with the **Windows Add Printer Wizard**.

NOTE: The **Windows Add Printer Wizard** does not provide any custom options. If you install the HP UPD by using this method, the driver installs so that the user has common printing functionality.

1. Select **Start** and then **Devices and Printers**.
2. Select **Add a printer**.

NOTE: The steps listed here are for Windows 7. The screens of the wizard may vary slightly between operating systems. For example, in Windows 8/8.1 and later Windows operating systems, the first dialog searches for the printer. Select **The printer that I want isn't listed** to move to the next screen. On the next screen, select **Add a printer using a TCP/IP address or hostname** and then click **Next**.

3. Select **Add a local printer**.

NOTE: If you are using an existing port, or if you are specifying the **Port Name** instead of using the default, make sure that the name you use does not contain the colon ':' character. This character is not allowed, and will cause configuration and status communication problems with the printer.

4. Select **Create a new port**, select **Standard TCP/IP Port** and then select **Next**.
5. Deselect **Query the printer and automatically select the driver to use**.
6. In the **Hostname or IP address** field, type the DNS or WINS host name or IP Address.

NOTE: For Windows Server 2008R2, if the DNS host name is used for the port, click the "Always print to this device, even if its IP address changes" check box.

7. Select **Next**.

NOTE: If the **Additional Port Information Required** dialog box opens, it means the printer is not connected. Under these circumstances it is best to cancel out of the installation, connect and turn on the product, and then start over. If you must continue the installation, then under **Device Type**, select **Standard**, and then select **Hewlett Packard JetDirect** from the menu. Then select **Next**.

NOTE: Installing the HP UPD with the product disconnected or offline prevents the HP UPD from receiving the product configuration, which results in using default settings (monochrome, no job storage, etc.). Following the complete install of the HP UPD, to update the HP UPD product configuration, right-click the printer, select **Printer properties**, select the **Device Settings** tab, scroll down to **Automatic Configuration** and select **Update Now**.

8. The **Install the printer driver** dialog box opens.
9. Select **Have Disk**.
10. Browse to the folder in which the unzipped HP UPD download file is saved.
11. In the unzipped HP UPD file, select any .inf file, select **Open** and then select **OK**.

12. Select either the generic name or a version specific **HP Universal Printing** driver.

NOTE: HP recommends using the versioned driver on print servers.

13. Select **Next**.

14. Enter a printer name or use the default printer name.

NOTE: The name specified in the **Printer name:** field is the name of the installed printer that displays in the **Devices and Printers** folder. The default printer name for the non-versioned PCL 6 driver is “HP Universal Printing PCL 6” for the first installation. However, this increments to “HP Universal Printing PCL 6 (copy1)” and so on for subsequent installs.

HP recommends renaming the printer to better identify the printer.

15. Click **Next**.

16. After the installation is complete, the **Printer Sharing** dialog opens. Select **Do not share this printer**, or enter a **Share name:** to share the printer.

17. Click **Next**.

18. Select or deselect **Set as the default printer** and if you want to print a test page, click **Print a test page**. Once the test page prints, click **Finish**.

Method 2: Windows client/server: Use INSTALL.EXE wizard

Follow these steps to install the HP UPD by using the HP Universal Printing Install.exe wizard.

1. If you have not downloaded the HP UPD installation files, see [Download and unzip the HP UPD installation files](#) in this chapter.
2. Navigate to the HP UPD folder.
3. Scroll down and double-click **Install.exe**.
4. If a message dialog displays asking if you want to allow the following program to make changes to this computer, click **Yes**.
5. When the **Universal Printing Installer** wizard opens, read the software license agreement, and then click **Yes** to continue.
6. When the Installation Mode dialog box opens, select **Traditional mode** and click **Next**.

NOTE: Only traditional mode queues are supported on print servers. Do not create and share dynamic mode queues on any print server.

7. Click **Add a local printer** and then click **Next**.

8. To add a new port, select **Create a new port**, select **Standard TCP/IP Port** in the drop down list, and then click **Next**.

9. Deselect **Query the printer and automatically select the driver to use**.

10. Type in the IP address or hostname, and then click **Next**.

11. Select the versioned HP UPD driver from the list and then click **Next**.

NOTE: HP recommends using the versioned driver on print servers.

12. If an HP UPD is currently installed, select **Replace existing driver** and then click **Next**.

13. When the **Type a printer name** dialog opens, rename the printer to better identify the printer, and then click **Next**.

NOTE: The name specified in the **Printer name:** field is the name of the installed printer that displays in the **Devices and Printers** folder. The default printer name is **HP Universal Printing PCL 6 (v6.x.x)** for the first installation. However, this increments to **HP Universal Printing PCL 6 (v6.x.x) (copy1)** and so on for subsequent installs.

14. When the **Printer Sharing** dialog opens, select **Do not share this printer**, or enter a **Share name:** to share the printer.

15. Click **Next**.

16. Select or deselect **Set as the default printer** and if you want to print a test page, click **Print a test page**. Once the test page prints, click **Finish**.

17. Click **Finish**.

Method 3: Windows client/server: Use command prompt (INSTALL.EXE with switches)

1. To access the command prompt, click **Start, All Programs, Accessories**, and then right click **Command Prompt** and select **Run as administrator**. If prompted, "Do you want to allow the following program to make changes to this printer?" click **Yes**.

NOTE: Windows requires a user to have Administrator rights to install a printer driver.

2. At the command prompt, change to the directory where the HP UPD is located (for example, C:\HP Universal Print Driver\pcl6-x64-6.3.0.21178)

3. Type `install.exe /option` and select Enter, where option is the command option. For a list of available command options, see [Available options when installing by command prompt](#) in this chapter. Use the command options to control the installation and the behavior of the HP UPD after installation.

NOTE: To view a complete list of installer options, type the following at the command prompt:

```
c:\folder\install /?
```

- For example, to make the installation silent by making it available through an .EXE-based administration tool (such as SMS), type the following syntax at the command prompt:

```
install.exe /q /h
```

- The /h switch hides the HP install dialogue.

- Or, to install the driver in dynamic mode, type the following:

```
install.exe /dm
```

NOTE: In an enterprise environment, a login script may be used to install the HP UPD on a client.

For more information about the command options, see the following sections:

- [Manage printer default settings after installation](#)
- [Available options when installing by command prompt](#)

Manage printer default settings after installation

When a printer gets installed, certain default settings are automatically set based on what capabilities are available from the product. These default settings include items such as default paper size and type, simplex (single side printing), and portrait or landscape printing. In many printing environments it is common for printing administrators to change the default settings. Some of the more common changes are to enable printing on both sides of the paper (duplex) and to print in grayscale.

There are many ways to change or pre-configure these default settings and some are discussed in other chapters of this System Administrator's Guide. This section primarily discusses how these new default settings are deployed and how to manage or provide firmer controls on changes allowed to these default settings.

Default settings and changes are not managed

Other sections in this document describe the use and procedures for changing the default settings in both a Point and Print and Direct IP Printing environments. Please refer to the sections on HP DCU, HP DDU, and INSTALL.EXE for specific instructions on how to use these tools in Chapter 4.

It is important to understand that changes to the printing default settings are at most temporary and basically not managed. Users have the ability in both Direct IP Printing and Point and Print environments to change the default settings on their printers through the Printing preferences tab. In some cases, depending on company policies, a centralized management approach is necessary to ensure that the default settings are not changed.

Manage default settings with Active Directory Administrator Templates

HP's solution for printer policy settings using an existing Active Directory environment is to use the Active Directory administrator templates inside each of the group policy objects. This template also allows an administrator to set defaults for duplex and grayscale printing. These policies are pushed locally into the users registry and referred to during printing. This has the effect of constantly refreshing the users default settings so that each time a user prints, the correct default settings are present. Policies are pushed to the client PCs.

Please refer to the sections on using Active Directory Administrator Templates for further information (chapter 8).

For more information on using AD templates, see the You-Tube video "Using HP Active Directory Administrator Templates" at <http://youtu.be/UUN2sEggnuc>.

Available options when installing by command prompt

To view these options, enter the following at the command prompt:

```
C:\Driver-Folder\Install.exe /?
```

where

- **Driver-Folder** is the location of the INSTALL.EXE file.
- **/** is a forward slash. Do not add any spaces between the forward slash and the command option.

The command options are explained in the following table.

Table 5-1 Command options

Command option	Definition	Description
/aml	Adds a new managed printer list name using the specified URL (dynamic mode only). For example: /aml"My Server", http://mywebserver Or: /aml"My Printers", "\\myprinters\printerlist\printerlist.xml"	Use this option to specify a location where the target system can look for the managed printer list.

Command option	Definition	Description
/dgst	Disables the Services tab globally on the HP UPD for all print queues.	Use this option to completely disable and hide the Services tab when accessing the printer property pages.
/dm	Installs the printer in dynamic mode	Use this option to force the HP UPD to install in dynamic mode.
/gcfm	The new install switch copies the driver pre-configuration file (hpcpu*.CFM) to the client %systemroot% \..\.3 directory. For example: install.exe /tm /gcfm"c: \driverpackage\duplex.cfm	Beginning with HP UPD v5.2.5, you can use the /gcfm option when installing from the command line using INSTALL.EXE to copy the .CFM file, which was created with the HP DCU.
/gcomname"name"	Specifies a system-global SNMP community name	
/h	Hides the install dialog box; must be used with Quiet mode (/q)	Use this option to hide the primary HP installation dialog box and produce a silent installation.
/infremove	Remove all versions of the HP Universal Printing Driver from the Windows driver store. The /q and /h switches are required. No other switches are supported with /infremove.	
/infstage	Stage driver files to the Windows driver store for printer plug and play software first installation. The /q and /h switches are required. No other switches are supported with /infstage.	
/m	Provides the ability to specify the driver version name allowing multiple versions of HP UPD to be installed onto one system. This command option is only available in traditional mode.	The /sm is required when /m is used. It cannot be used with /sm\server\printer. The /n is optional. Syntax example /m"HP Universal Printing PCL 6 (v5.0)" /sm10.1.3.2 If a syntax error exists in the command line switch, installation proceeds without implementing the /m version-specific installation of the HP UPD. NOTE: HP UPD v5.2.6 and earlier require that the full name and version are provided with the /m switch, as in the above syntax example ("HP Universal Printing PCL 6 (v5.0)"). HP UPD v5.3 and forward does not require the full name or version when using the /m switch.
/n"Printer Name"	Uses the specified name as the name of the printer, for example: /n"HP LaserJet P4515"	This option uses the specified name as the name of the printer (for example, HP Color LaserJet M750). This option is helpful when using the traditional mode (/sm) option, but can be used for common printing as well.

Command option	Definition	Description
/nd	Does not set the printer as the default.	This option does not change the current default printer on the client system. By default, the installer sets the newly installed or updated common printer as the default printer.
/ni	Does not perform the printer install, only processes other install options	Use this option to process the specified install options without creating a printer in the Printers folder. You can then create subsequent instances of the HP UPD that show only the configured options that are not queue specific.
/npf	Do not open the Printers folder on completion.	The default behavior of the installer is to open the Printers folder on completion. This option disables that functionality.
/pqdads	Disables ADS policy checking for the current print queue (logical windows printer) no matter who uses it.	
/q	Quiet mode, no prompts	Use this option to install the driver and present only a single progress dialog box to the user. All other HP installer related warnings and confirmations are hidden, and default actions occur in cases where user input would otherwise be expected.
/qcomname" name"	Specifies a queue-specific SNMP community name	
/ru	Restricted user mode only displays HP Managed Printer Lists (dynamic mode only)	Use this option to configure the driver so that users can only print to the products that you specified in the managed printer lists. The Printer Selection dialog box is replaced with a dialog box that lists the printers in the managed printer list. For more information, see Use Managed Printer Lists (MPLs) in chapter 9.
/s	Provides the ability to specify the virtual node for cluster installation. Available with HP UPD v5.3 forward.	Install the HP UPD from one of the cluster nodes on the virtual node. (HP recommends running this command from the active node.) Syntax example: install /s\\VirtualServerName NOTE: There is no space between “\” and “VirtualServerName”.
/sc	Simple confirmation (dynamic mode only)	Use this option to install the driver so that location profiles are disabled in the Printer Selection dialog in dynamic mode.

Command option	Definition	Description
/sm<port>	<p>Creates a traditional printer instance bound to a specific <port>. The syntax is: /sm\\servername\sharename</p> <p>Or:</p> <p>/smPrinterHostname</p> <p>For example: /sm15.65.98.111</p> <hr/> <p>NOTE: This option implies the driver is installed in traditional mode. The /tm should not be used in combination with the /sm option.</p>	<p>Use this option to create a statically bound printer that points to the specified port (local, TCP/IP, IPX/SPX, Hostname, UNC). If the port already exists, the existing port is used. If it does not exist, then a new port is created. The printer operates as a normal queue.</p> <hr/> <p>NOTE: If the HP Universal Print Driver is installed in traditional mode, the static mode printer does not allow the user to use the universal printing functionality or change the destination address of the static mode printer.</p>
/snptm=0	Disables the Special Offers program pop-ups.	
/tm	<p>Installs the printer in traditional mode</p> <hr/> <p>NOTE: Cannot be used with the /sm option.</p>	<p>Use this option to force the HP UPD to install in traditional mode. This routine launches the Add Printer Wizard, and prompts the user to select a printer port to complete the process.</p> <p>Do not use this option when using the /sm option.</p>
/u	Use the existing print driver if it is already installed	Use this option to remove the dialog box asking the user to "Use existing driver" or to "Replace existing driver." To reduce installation time, use this option if you must install several printers using the same driver.

Method 4: Windows client/server: Use Point and Print

To use the HP UPD and Point and Print, install the driver on the print server in **Traditional mode**. After the driver installs on the Windows server, it behaves as any other installed driver. The user prints to a statically bound port established on the server.

When a client PC connects to a shared printer, the HP UPD automatically downloads to the client PC through Point and Print.

Vending of 32-bit drivers is supported from all 64-bit server OSs. Vending of 64-bit drivers is supported from all 32-bit OSs that support 64-bit alternate drivers. To vend a driver from a 64-bit server to a 32-bit client, the server must have the 32-bit driver installed. To vend a driver from a 32-bit server to a 64-bit client, the server must have the 64-bit driver installed.

Configuring a 64-Bit Server for 32-Bit Clients

If you are supporting 32-bit clients on a 64-bit server, you must also install the 32-bit version of the driver on the server with exactly the same name and version.

1. Download the 32-bit driver to the server, unselect "When done unzipping open: .install.exe," and then unzip the driver.
2. In the **Printers** dialog of the server, highlight a print queue, and then select **Print server properties**.
3. Select the **Drivers** tab, and select **Add**.
4. In the **Add Printer Driver Wizard**, click **Next**.

5. Select **x86** (32 bit) and deselect **x64** (64-bit).
6. Click **Next**.
7. Click **Have Disk** and then browse to the location where you downloaded and unzipped the 32-bit driver.
8. Click **Open**, click **OK**, and then select the 32-bit driver with the same name as the 64-bit driver installed on the server.

NOTE: HP recommends using the versioned driver on print servers. For example, if you installed the HP Universal Printing PCL 6 (v6.3.0) 64-bit driver on the server, select the HP Universal Printing PCL 6 (v6.3.0) 32-bit driver.

9. Click **Next**, and then click **Finish**.
10. Verify the 32-bit driver (x86) is listed with the same name as the 64-bit driver, and then click **Close**.

Method 5: Windows client/server: Use HP Web Jetadmin Print Queue Creation

The HP UPD can also be installed on some operating systems via HP Web Jetadmin Print Queue Creation. For more information, go to the following Web site:

www.hp.com/go/wja

Method 6: Create a driver instance with plug and play

The HP UPD can be installed for use with plug and play products as either a software first or a hardware first installation.

- **Software first (unattended) installation – recommended**
- **Hardware first installation**

NOTE: The “HP LaserJet USB (DOT4) communication driver...” must be installed on Windows 8 / 8.1, Windows 10, Windows Server 2012 / 2012R2 and Windows Server 2016 systems prior to connecting the device. This component is available for download at <http://www.hp.com/go/upd>.

Software first (unattended) installation – recommended

In a software first installation, the HP UPD is pre-staged on the PC in the Windows driver store, and will be found and used by the operating system when the new product is connected. This method does not require any interaction by the current user, and does not require the user to have administrator privileges.

NOTE: Starting with UPD 5.6.5, new options in install.exe for Windows 7 and later Windows operating systems add the ability to select USB mode for Plug and Play with options to remove all versions of HP Universal Printing Driver from Windows driver store, or to add the HP Universal Printing Driver to Windows driver store.

Using these options only impact the Windows driver store. No HP UPD printer is installed, no printer driver is removed and no existing print queues are impacted. Only the HP UPD is only added to the driver store. No non-HP UPD drivers are impacted.

As an alternative, on Microsoft Windows 7 and later Windows operating systems, you can use the pnputil utility to pre-stage the required drivers. To ensure that all the required components are added to the driver store, HP recommends pre-staging all HP UPD delivered *.inf files with pnputil, using the command: pnputil -a *.inf. For more information, see USB connectivity.

Pre-configure and install the HP UPD for use with software first installation

To pre-configure the HP UPD for a Software first, plug and play installation, use the HP Driver Deployment Utility (HP DDU) (available as part of the HP Print Administrators Resource Kit), and select the Preload the Driver option. This method creates a package with a setup.exe utility that is easy to deploy interactively or via scripting. See [Pre-configure the HP UPD default settings using HP Driver Deployment Utility](#) in chapter 4 for more information.

NOTE: For Windows 7 and later windows versions, this works for DOT4 devices, but not for LEDM devices. LEDM devices require the usage of pnputil.

Driver selection when multiple drivers are pre-loaded

It is possible that multiple versions of the HP UPD might be pre-staged at the time of initiating a Plug-and Play event. When the operating system detects multiple compatible drivers, it uses the following criteria for selecting the driver to use:

1. A WHQL certified driver has priority over all other drivers. If all available drivers are WHQL certified, the operating system considers the next criteria.
2. Microsoft 7 and later operating systems evaluate the driver based on available features where the driver with the most features is selected. If all drivers are deemed equal, the operating system considers the next criteria.
3. Finally, the operating system selects the driver with the most current date.

To remove older versions of the HP UPD, select the install.exe option “*Remove all versions of the HP Universal Printing Driver from Windows driver store*”

NOTE: The Remove Plug and Play Drivers utility in HP PARK can also be used to search for HP plug and play printer driver files in the Windows driver store, and provides an option to remove these staged printer driver files. Currently installed printers are unaffected by this utility.

Only the default location for staged driver files on Windows (%SYSTEMROOT%\inf) will be searched for driver files.

For more information on the HP PARK, see [HP Print Administrator's Resource Kit \(HP PARK\)](#) in chapter 4.

In addition, see the video “Staging Drivers for PNP using HP RemovePNPDrivers Utility” at http://youtu.be/XZ2SvUuR_3c.

Hardware first installation

In a hardware first installation, a USB cable is connected to the PC first and *then* the HP UPD is installed. When the operating system detects that no driver is installed for the connected product, it will prompt for a disk or a location from which to install the driver. This method requires that the user be logged onto an account with administrator privileges.

- If you have not downloaded the HP UPD installation files, see [Download and unzip the HP UPD installation files](#) in this chapter.
- Plug in the product USB cable.
- When prompted, browse to the location where the HP UPD was downloaded and unzipped.

NOTE: It is possible for the system to not prompt for a disk in cases where the system finds a compatible driver in the driver store and/or on Windows Update.

USB connectivity

Disabling HP Smart Install (if present)

Several low-end HP LaserJet models have HP Smart Install enabled by default. If the HP UPD driver should be used during a plug and play event, HP Smart Install must be disabled at the control panel before starting the install process.

How to disable HP Smart Install

- On products with an LCD display (2 line display), use the right arrow to scroll to and select the **Services** menu, scroll down to **HP Smart Install**, and then change the setting to **Off**.
- On products with a touch screen, touch the tools icon, touch the **Services** menu, scroll down to **HP Smart Install**, and then change the setting to **Off**.

You can also disable HP Smart Install using the HP Embedded Web Server of the product (from the **HP Smart Install** tab) or with the HP Smart Install Utility (SIUtility.exe and SIUtility64.exe). However, this requires the printer to be connected to the network prior to using the USB connection.

See also: www.hp.com/hpinfo/newsroom/press_kits/2010/plugandprint/pdf/Smart_Install_FAQ.pdf

Disable obtaining driver software from Windows Update by default (optional)

When a USB device is connected, Windows always searches for Windows Update. It is possible to disable this feature and only use previously installed drivers when connecting a USB device. This will speed up the installation time.

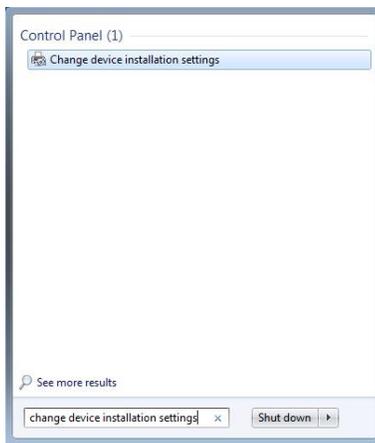


Figure 5-2 Start Menu

1. From the **Start** menu, type “*change device installation settings*”. The option displays in the **Programs** list.
2. Click the icon for **Change device installation settings**



Figure 5-3 Device Installation Settings

3. Change the setting from **Yes** to **No, let me choose what to do**

4. Click **Never install driver software from Windows Update**
5. Click **Save Changes**

Pre installing the HP UPD Using Install.exe

Starting with UPD 5.6.5, new options in install.exe add the ability to select USB mode for USB Plug and Play with options to remove all versions of HP Universal Printing Driver from Windows driver store, or to add the HP Universal Printing Driver to Windows driver store.

NOTE: These settings only impact the Windows driver store. No HP UPD printer is installed, no printer driver is removed and no existing print queues are impacted. Only the HP UPD is only added to the driver store. No non-HP UPD drivers are impacted.

1. Go to www.hp.com/go/upd and download the HP UPD
2. Save the file, and then double-click the executable. The WinZip Self Extractor screen displays.

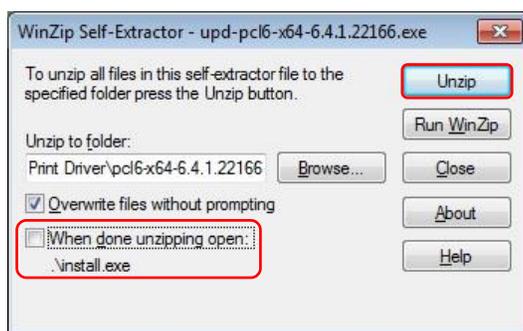


Figure 5-4 WinZip Self Extractor screen

3. Uncheck **When done unzipping open: .\install.exe**.
4. Click the **Unzip** button. The driver is extracted (by default to c:\HP Universal Print Driver<driver version>).
5. Click the **Close** button.

NOTE: In a plug and play, Windows 7 and later Windows operating systems, check Windows Update first during a plug and play install. To prevent inadvertently downloading a device specific driver, disable Windows Update temporarily.

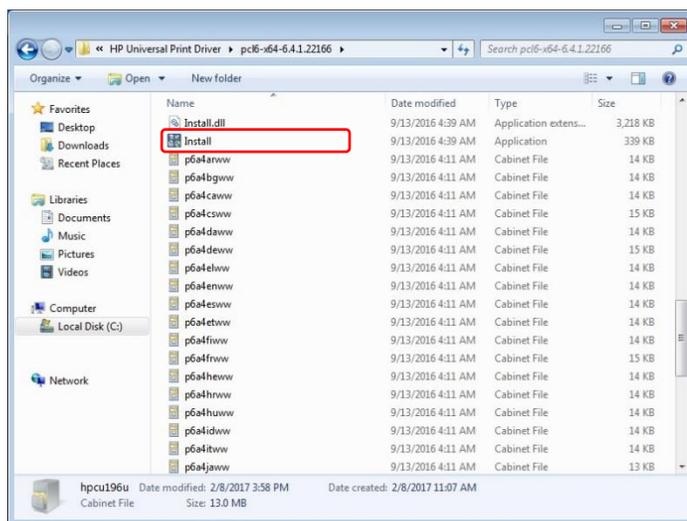


Figure 5-5 UPD driver directory

6. Open the directory for the HP Universal Printing Driver
7. Double click Install.exe

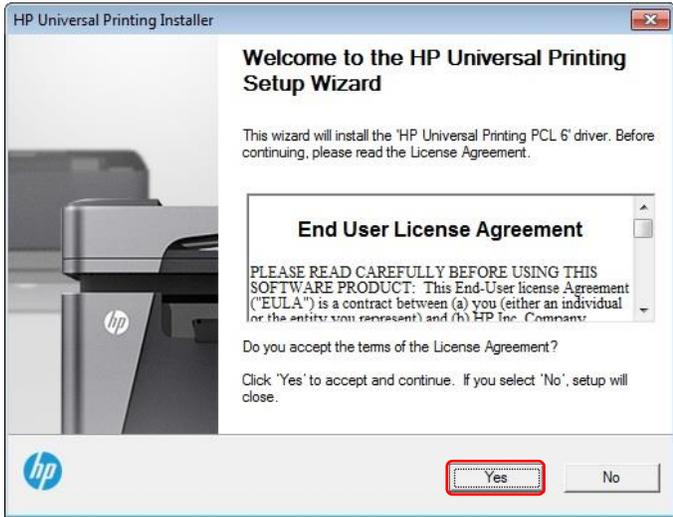


Figure 5-6 End User License

8. When the license dialog appears, read the license agreement and then click **Yes**.

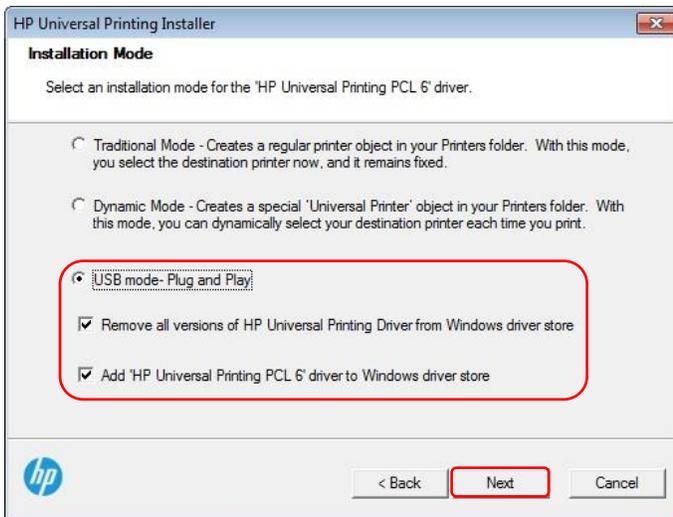


Figure 5-7 Installation Mode

9. Select **USB mode- Plug and Play**.

NOTE: By default, *Remove all versions of HP Universal Printing Driver from Windows driver store* and *Add 'HP Universal Printing PCL 6' driver to Windows driver store* is selected.

When Add 'HP Universal Printing PCL 6' driver to Windows driver store is selected, INF files for the following are added:

- HP EWS UPD inf
- HP PNP EWS Null inf
- HP PNP Fax Null inf
- Dot 4 inf files for various HP products
- HP Printer LEDM inf

NOTE: Dot4 and LEDM are communication protocols used with USB connected HP PNP Scan Null inf printers.

- To add the HP UPD to Windows driver store and not remove any inf files for previous versions of the HP UPD, uncheck **Remove all versions of HP Universal Printing Driver from Windows driver store** and leave the other option checked
- If you only want the HP UPD inf files removed and no inf files added, uncheck **Add 'HP Universal Printing PCL 6' driver to Windows driver store** and leave the other option checked.

NOTE: This option is useful if you plan to utilize a device specific driver for plug and play installations.

- To add the HP UPD to Windows driver store and remove any inf files for previous versions of the HP UPD, verify both options are checked.

10. Click the **Next** button.

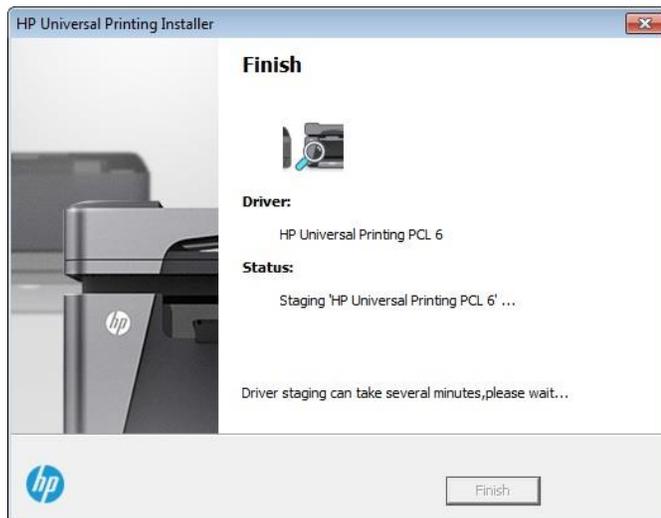


Figure 5-8 Staging driver screen

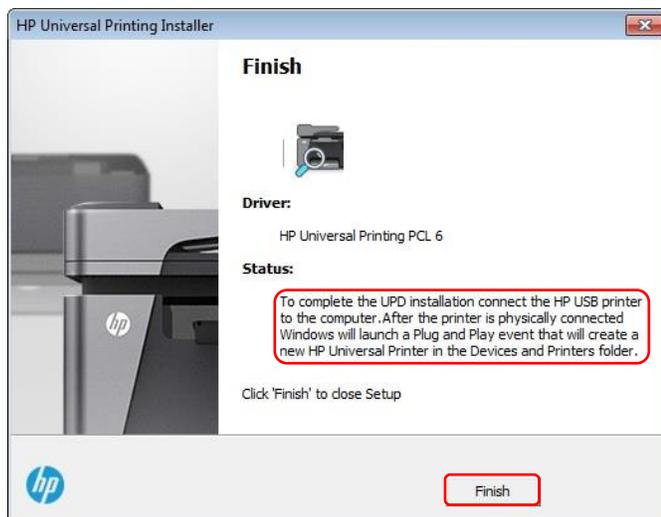


Figure 5-9 Message to connect the USB printer

11. Click the **Finish** button to close the installer dialog.
12. Verify the product is turned on and in the Ready state.

NOTE: The driver is extracted (by default to c:\HP Universal Print Driver\

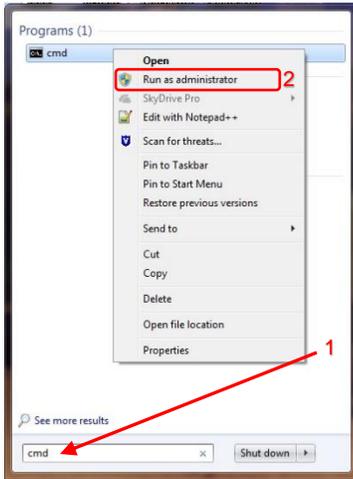


Figure 5-13 Start screen

5. Click **Start**, and then type **cmd** in the **Search programs and files** search box.
6. Right-click the **cmd.exe** program, and then click **Run as administrator**.

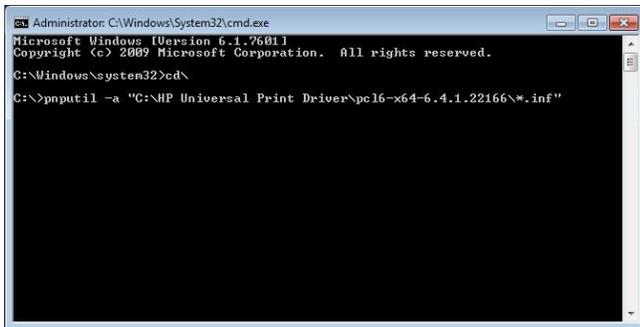


Figure 5-14 Command Prompt

7. Pre- install all drivers (such as the printer driver, LEDM driver, DOT4 driver, etc.). After the C:\ prompt, type:
`pnputil -a "C:\HP Universal Print Driver*.inf"`

NOTE: <driver version> should be replaced with the actual driver version.

NOTE: For more information on pnputil, refer to Microsoft: [www.msdn.microsoft.com/en-us/library/windows/hardware/ff550419\(v=vs.85\).aspx](http://www.msdn.microsoft.com/en-us/library/windows/hardware/ff550419(v=vs.85).aspx)

8. Close the cmd line window.
9. Connect the product to the computer using a USB cable.

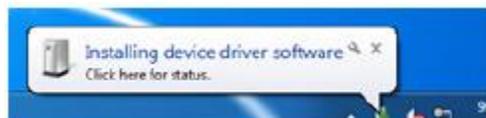


Figure 5-15 Installing device

10. A window displays in the lower right-hand corner that indicates the software is installing.
11. The product will be identified in the **Devices and Printers** folder.

NOTE: Microsoft uses a ranking process when selecting a driver during a PNP USB install.

If there is a conflict where a different driver may be installed, the RemovePNPDrivers utility can be used to search for HP plug and play printer driver files in the Windows driver store, and provides an option to remove these staged printer driver files. Currently installed printers are unaffected by this utility. The RemovePNPDrivers utility is included with the HP Printer Administrator's Resource Kit (HP PARK). For more information on the HP PARK in this document, see [HP Print Administrator's Resource Kit \(PARK\)](#) in chapter 4.

For more information on using the RemovePNPDrivers utility, see the video "Staging Drivers for PNP using HP RemovePNPDrivers Utility" at http://youtu.be/XZ2SvUuR_3c.

Only the default location for staged driver files on Windows (%SYSTEMROOT%\inf) will be searched for driver files.

Pre-installing using the HP Smart Device Agent Base for USB Plug and Play

NOTE: This section explains how to install the HP Smart Device Agent Base for USB Plug and Play included with HP UPD 6.4.1 and later releases. For the latest information on installing using the HP Smart Device Agent Base, see the white paper: "[Pre-installing using the HP Smart Device Agent Base for USB Plug and Play](#)."

Pre-installing using the HP Smart Device Agent Base for USB Plug and Play software:

- Integrates an SDA "base" component for USB connected printers
 - Enables customers to move from self-managed to MPS with ease
 - Installs the Windows Local Service HP Smart Device Agent Base
 - Installs silently (no UI) by executing a separate msi as a step in the USB driver install
 - Simple and secure
-

NOTE: The HP Smart Device Agent Base does not collect any data from the PC or from connected printers or mfps. The service does not communicate with the cloud or listen on any ports. It cannot be used by anything except a verified JetAdvantage Management Connector (JAMc) instance.

During the install process, the HP Smart Device Agent Base software performs the following items:

- Installs the HP Smart Device Agent Base
- Pre-stages the HP UPD in the Windows driver store

Once installed:

- The HP Smart Device Agent Base searches for USB connected printers. If none are found, the service goes into sleep mode for one hour and then checks again, repeating this sequence.
- If the service determines that a USB-connected printer is present, the service does a DNS query to see if JAMc is available. If it does not find JAMc, the service checks to see if JAMc is available through a UDP multicast over ports 49001-49008.
- If no JAMc is found, the service does not check again until the computer is rebooted.

To install the HP Smart Device Agent Base for USB Plug and Play

NOTE: To pre-configure the HP Smart Device Agent Base for USB for a Software first, plug and play installation, use the HP Driver Deployment Utility (HP DDU) available as part of the HP PARK tools, and select the Preload the Driver option. This method creates a package with a setup.exe utility that is easy to deploy interactively or via scripting. See [Pre-configure the HP UPD default settings using HP Driver Deployment Utility](#) in chapter 4 for more information.

1. Go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand the section **Driver – Universal Print Driver for Managed Services** and click **Download** to the right of one of the following packages:
 - HP Universal Print Driver for Windows PCL6 (32-bit) for USB connected printers
 - HP Universal Print Driver for Windows PCL6 (64-bit) for USB connected printers
 - HP Universal Print Driver for Windows PostScript (32-bit) for USB connected printers
 - HP Universal Print Driver for Windows PostScript (64-bit) for USB connected printers

NOTE: The actual HP UPD version number may vary.

2. Click **Save**
3. Unzip the HP UPD download file.
 - a. Double-click the downloaded file or click **Run**
 - b. Uncheck the box to the left of **When done unzipping open: \install.exe**.
 - c. Click the **Unzip** button.
 - d. When the unzip process completes, click **OK**, and then click **Close**.
4. To install using the default settings, open the directory C:\HP Universal Printer Driver
 - a. Open one of the following folders:
 - pcl6-usb-setup-x32-6.5.0.22695
 - pcl6-usb-setup-x64-6.5.0.22695
 - ps-usb-setup-x32-6.5.0.22695
 - ps-usb-setup-x64-6.5.0.22695

NOTE: This software installation requires .NET 4.5 or higher to install.

- b. Double click **Setup**
- c. If a prompt appears asking, “Do you want to allow the following program from an unknown publisher to make changes to this computer?”, click **Yes**

NOTE: This removes the existing UPD packages in driver store, performs the HP UPD driver staging with notification, and installs the HP Smart Device Agent Base.

- d. When the message “Removal Completed...” appears, click **OK**
 - e. When the message “Driver Pre-Staging Completed Successfully” is displayed, click **OK**.
 - Microsoft Services will list **HPSmartDeviceAgentBase** as running in Services.msc
 - A driver prestaging log and service execution log is saved and available in the package directory
 - For example, *c:\HP Universal Print Driver\pcl6-usb-setup-x64-6.5.0.22695\Installer\ExecutionLogs*
5. To install from the command prompt, click **Start, All Programs, Accessories**, and then right click **Command Prompt** and select **Run as administrator**.

NOTE: If you do not run the command prompt as administrator, a popup requesting the admin password might be displayed. If you do not enter the password, “Access is denied.” is listed after the command prompt.

- a. If prompted, “Do you want to allow the following program to make changes to this computer?” click **Yes**.
- b. Change to the directory where you extracted the files. For example, C:\HP Universal Print Driver\pcl6-usb-setup-x64-6.5.0.22695.
- c. Type *Setup -m help* and press **Enter** to view the available install options. The following options are available:
 - stgn – Stages the driver with notification
 - stgq – Stages the driver in quiet mode
 - remstgn – Removes the existing UPD packages in driver store and stages the driver with notification
 - renstgq -- Removes the existing UPD packages in driver store and stages the driver in quiet mode
 - remn – Removes the existing UPD packages in driver store with notification
 - remq – Removes the existing UPD packages in driver store in quiet mode

To install using one of the optional methods, type *Setup -m <optionName>*.

NOTE: By default, *Setup* removes the existing UPD packages in driver store and performs driver staging with notification.

- d. Type *Setup* with the appropriate options. For example, to remove the existing UPD packages in driver store and perform driver staging with notification type *Setup -m remstgn*.
- e. Press **Enter** to start the install process.
 - If notification is enabled, a message appears stating “Driver Pre-Staging Initiated...”
- f. If the message “Removal Completed...” appears, click **OK**
- g. When the message “*Driver Pre-Staging Completed Successfully*” is displayed, click **OK**.

NOTE: If you are running in quiet mode, *Driver Pre-Staging Completed Successfully* appears in the command prompt.

- Microsoft Services will list **HPSmartDeviceAgentBase** as running in Services.msc
- A driver prestaging log and service execution log is saved and available in the package directory
 - For example, c:\HP Universal Print Driver\pcl6-usb-setup-x64-6.5.0.22695\Installer\ExecutionLogs

6. Verify the product is turned on and in the Ready state.
7. Connect a USB cable between the product and the computer.
8. Click the window in the lower right-hand corner that indicates the software is installing.
9. When the Plug and Play event finishes, click **Close**.

To Uninstall the HP Smart Device Agent Base Service

1. Click **Start** and then **Control Panel**.
2. In Category view, click **Uninstall a program**.
3. Select **HPSmartDeviceAgentBase**.
4. Click **Uninstall**.
5. Click **Yes**.
6. If prompted, “Do you want to allow the following program to update software on this computer?” click **Yes**.
7. Close the **Programs and Features** dialog.

Method 7: Other supported Microsoft driver installation methods

You can use the following Microsoft installation methods to install the HP UPD driver:

- Microsoft Print Management — This is a snap-in for the Microsoft Management Console. Use it to install the HP UPD driver and create a printer instance.
- Printui.dll — This Microsoft executable (rundll32 printui.dll PrintUIEntry [options]) contains command line options for installing printer drivers, such as the HP UPD driver.

NOTE: For information about using these methods, see the appropriate Microsoft documentation.

Environment A: Windows Cluster server environment

The HP UPD installs with automatic configuration enabled by default and requires a specific installation procedure. This requires that certain COM objects be registered and initialized in order to perform the automatic configuration of the products during setup. The following instructions provide information on installing the HP UPD in a Windows Server 2008R2 Cluster server environment. For Windows Server 2012 and beyond, Microsoft redesigned its clustering technology to use their Hyper-V technology, and this additional step is no longer necessary.

NOTE: HP UPD v4.7 introduced the capability to disable Printer Automatic Configuration communications (when using traditional mode). This capability is useful if the HP UPD cannot be installed on each physical node, as recommended by HP.

The HP UPD must be installed and initialized on every physical node that makes up the cluster environment before creating queues on the virtual servers. HP recommends installing the HP UPD in traditional mode using the LPT1 port on each physical node. After the printer is created, it can be deleted from the physical node's Devices and Printers folder if desired. This will leave the HP UPD driver intact and properly initialized.

Only traditional mode printer queues can be shared from any of the Microsoft based print servers. Sharing of dynamic mode queues is not supported on any print servers using the HP UPD.

Repeat Step 1 on each physical node before proceeding.

1. Install the driver on each physical node in the cluster, for example by using the Add Printer Driver Wizard.
 - a. If you have not downloaded the HP UPD installation files, see [Download and unzip the HP UPD installation files](#) in this chapter.
 - b. Log into or remotely connect to one of the physical nodes.
 - c. Open the Printers folder.
 - d. Click Add Printer.
 - e. Select Local printer attached to this computer and click Next.
 - f. Click Use the following port and select LPT1: (Recommended) Printer Port.
 - g. Click Next.
 - h. Browse to your HP UPD Installation files and click Next.
 - i. Follow the rest of the Add Printer Wizard procedure to complete the installation. See [Method 1: Windows client/server: Use Add Printer wizard](#) in this chapter for more information.
2. Install the HP UPD on the virtual print server.

Installing the HP UPD on the virtual server is similar to installing the HP UPD on any print server. Install the traditional mode of the driver, using the Add Printer Wizard of the virtual server.

If you use HP UPD 5.3 or later, you can use the /s option to install on the virtual node. (HP recommends running this command from the active node.) Use the following steps:

- a. Log into the active node of the cluster. You can log in while at the machine or remotely.
- b. Run INSTALL.EXE using the /s option with the following syntax:

```
install /s"\\VirtualServerName"
```

NOTE: There are no spaces between “\” and “VirtualServerName”.

NOTE: If prompted to use Existing Driver, select Replace Driver.

Alternative install with printer automatic configuration disabled

If the HP UPD cannot be installed on every physical node in your cluster, you can follow the steps below to disable Printer automatic configuration when installing the HP UPD.

See [Disable Printer Automatic Configuration](#) in chapter 7. These steps assume that you will be using the HP DCU utility to disable the printer automatic configuration. Save the configuration file as .CFM to retain the digital signature driver files.

Use the HP DCU (Driver Configuration Utility) tool to disable the printer automatic configuration setting and preset other default settings as needed. Once the .CFM file has been created, it resides in the HP UPD driver folder where the files are located. Copy this .CFM file to the virtual server w32x86\3 folder before installing printer queues using HP UPD.

NOTE: Beginning with HP UPD v5.2.5, you can use the /gcfm option when installing from the command line using INSTALL.EXE and the .CFM file, which was created with the HP DCU.

Use the following steps to copy the .CFM file to the proper folder prior to creating printer queues on the virtual server.

1. Browse to the print\$ share of the virtual server. Enter \\virtualserver\print\$ to access the Printers folder for the Physical node that is hosting the virtual server. You will see a few folders representing both the printing environment for the Physical Node as well as the GUID folder which represents the virtual server printing environment. The print\$ folder will appear with the following folders:
 - \BIDI
 - \color
 - \e7776de2-fbd9-4644-9jdt-0jsy —Virtual Server printing folder
 - \w32x86—Physical node printing folder (x64 for 64-bit)
2. Browse to the folder with the long GUID as the file name. Your GUID name will be different. This is the print environment for the virtual server.
3. Browse to the \Drivers\w32x86\3 directory of the GUID folder
4. Copy the .CFM file previously created by the HP DCU utility here.
5. Use the Microsoft recommended method to create printers using the **Add Printer Wizard**.

NOTE: For more information, see the white paper [Using Printer Drivers in Microsoft Cluster Environments](http://www.hp.com/go/upd) available at www.hp.com/go/upd.

Environment B: Windows Terminal Server/Citrix XenApp environments

Supported environments

The HP UPD is supported by HP in Citrix XenApp and Windows Terminal Server environments. HP has tested the HP Universal Printing Driver in Citrix XenApp environments.

Traditional Mode

The HP UPD can be installed in Traditional Mode on the Citrix XenApp server and will perform as a print driver for all compatible auto-created printers or redirected printers.

Dynamic Mode

Installing the HP UPD in Dynamic Mode on the Citrix XenApp server is not supported in a multi-user environment. Because the Windows operating system limits a print queue to one port at a time, multiple users would compete for the single port bound to the HP UPD queue if installed in Dynamic Mode.

Comparing HP and Citrix UPD Drivers

The HP UPD works well for mapping to any HP PCL or PS client print driver for auto-created client printers. It works well for any client, including thin clients with embedded operating systems.

The Citrix UPD has the ability to provide all printer configurations and user settings from the client printer (such as print-on-both sides as default) to the auto-created printer within the Citrix user session.

Table 5-3 Comparing HP and Citrix UPD Drivers

Platform	Citrix UPD	HP UPD
XenApp 5.x/6.x/7.x	Better choice for Windows clients	Better choice for non-Windows clients or thin clients

NOTE: Before beginning any new deployment or upgrade involving a Citrix XenApp or Terminal Server environment, HP recommends reading and following the instructions outlined in the HP whitepaper *HP Printers Supported in Citrix XenApp Server Environments* available at www.hp.com/go/upd.

Environment C: Novell / Micro Focus

Micro Focus iPrint is available with Open Enterprise Server (OES) and also as a Standalone version (iPrint Appliance).

Micro Focus iPrint offers a single, scalable solution for managing all of your printing across multiple office locations from any device. It lets your users print quickly, easily, and more securely.

Micro Focus iPrint provides secured enterprise print services for your desktops, laptops, and mobile devices. Micro Focus's iPrint solution integrates with your existing corporate printers, regardless of the printing vendor or brand allowing you to deliver self-service printer provisioning to your device users. It even works with your current users in Microsoft Active Directory or eDirectory.

NOTE: Novell iPrint has been rebranded to Micro Focus iPrint. For more information see: <https://www.novell.com/products/iprint/>.

For Novell, HP UPD is supported in traditional mode only. Dynamic mode is not supported.

Pre-configuration of the driver using the HP Driver Configuration Utility (HP DCU) is supported so that administrators can define defaults before driver installation.

The iPrint clients are now available with iPrint server and not as a separate download. You should install the iPrint client from the Welcome page of the iPrint server or iPrint Appliance.

For information on how UPD works in Print environment, see [Using Printer Driver Profiles](#) in the [OES 2015 SP1: iPrint Administration Guide](#) or [Using Printer Driver Profiles](#) in the [iPrint Appliance 2.1 Administration Guide](#).

Install the HP UPD in a Novell environment

NOTE: Use Novell's most current iPrint client. It is required that the client be installed even if all you are doing is uploading the driver to the Novell server. Novell has posted the iPrint client at the iPrint: Novell Open Enterprise Server 2 Web site. Click here to go to the iPrint: Novell Open Enterprise Server 2 Web site (www.novell.com/iprint).

HP UPD for Novell only supports static mode and not dynamic mode.

This has been tested with both User and Workstation printer setups.

To add the HP UPD driver and create the printer on the server, go to a computer that has the iPrint client installed.

Make sure that you have created a Print Manager object and Broker object.

1. If you have not downloaded the HP UPD installation files, see [Download and unzip the HP UPD installation files](#) in this chapter.
2. Upload the driver to the Novell server by using the Novell iManager Web page.
 - a. Select the **Manage Broker** task.
 - b. Click the **RMS Drivers** tab.
 - c. Click the **Add from file** button.
 - d. Select the HP UPD .INF file, and click **OK**.

The driver will begin to upload to the server. This process can take several minutes. Do not touch the Internet Explorer (IE) window while it is doing this.

- e. When it is done, you should see the HP UPD driver in the driver list.

NOTE: You can only upload drivers for the operating system you are currently working on. For example, if you open a browser on a Microsoft Windows 7 64-bit system, you can only download the Windows 7 64-bit driver.

3. Create an HP UPD printer on the server by using the Novell iManager Web page.
 - a. Open the Novell iManager Web page and login using your Novell credentials.
 - b. Select **iPrint** from the left pane.
 - c. Select **Create Printer**.
 - d. Type a printer name and browse to the container where the printer is to be installed.
 - e. Select the Print Manager name and click **Next**.
 - f. Type the IP address or Hostname of the printer and click **Next**.
 - g. Select the HP UPD driver in the **Microsoft Windows driver** drop-down menu.
 - h. Click **Next** or **OK** to create the printer.

To use the newly created printer on a PC.

1. Close any browser windows that you have open.
2. Install the iPrint client on the PC.
3. Go to the IPP printer page on the Novell server: <http://foo.example.com/ipp>.

4. Click the newly created printer.

You will get a message stating that the printer needs to be installed.

5. Click **OK**.

The driver will download and install. This will take a few minutes.

The printer is now installed on the local PC and will route print jobs to the Novell server.

If you use Microsoft Windows 7 with iPrint, then you have to install two Microsoft hotfixes (kb2511290 and kb2546651). See Novell TID 7001400 (www.novell.com/support/kb/doc.php?id=7001400).

NOTE: Verify that the `ShortInstallName` is set to its default value in the `iprint.ini` file. The default location for this file is: `/var/opt/novell/iprint/htdocs/iprint.ini`

Novell Distributed Print Services (NDPS)

The HP UPD will function with limited capabilities in the Novell NDPS environment. This is due to the HP UPD not being able to communicate with the product directly, therefore losing the ability to gather product specific information from the printer. HP UPD only makes the default settings available to the user. The HP UPD PCL driver defaults to black and white (PCL 6), no extra trays, no product specific paper handling, etc.

The HP UPD can only be used in traditional mode in the NDPS environment. In this mode, the HP UPD operates the same as a product-specific driver.

The latest patches for iPrint and Winspool must be applied to get the advanced printing features supported (such as N-up and Watermarks).

Uninstall the HP UPD

HP recommends using Microsoft operating system utilities to remove the HP Universal Print Driver from the Microsoft Windows operating system. This is the safest method to uninstall print drivers. HP does not recommend manually editing the Windows Registry or manually deleting driver files. This can destabilize the printing environment and is not supported.

HP recommends the following procedure to remove the HP UPD.

1. Delete all printers that use the HP UPD.
2. In the **Printers** dialog, highlight a print queue, and then select **Print server properties**.
3. Select the **Drivers** tab.
4. Select the HP UPD driver(s) to be uninstalled and click **Remove**.

NOTE: If Windows displays an error message that the driver is in use, stop and restart the print spooler using one of the following methods.

From a command prompt, type `net stop spooler` and then press **Enter** to stop the print spooler. Type `net start spooler` and then press **Enter** to restart the print spooler.

-or-

Open the **Services** applet in **Control Panel** (**Start**→**Run**→`services.msc`), select **Print Spooler**, and then click **Restart**.

Once the print spooler has been restarted, repeat the steps above to remove the print driver.

6 Upgrading the HP UPD

Introduction

This chapter contains the following sections:

- **Best practices—upgrade**
- **Upgrade steps**
- **Delete and recreate queues with AUTOUPGRADEUPD.EXE (traditional mode only)**

HP supports upgrading from one version of the HP UPD to a newer version of the HP UPD using the same PDL (for example PS), starting with v4.5. Upgrading from a non-HP Universal Print Driver to the HP Universal Print Driver, regardless of version or vendor, is not supported and requires deletion/recreation of queues.

Table 6-1 Upgrade versions and method

Current HP UPD version	Upgrade version	Methods	Additional comments
v4.7.x/ v5.0.x/ v5.1	v5.4 or later	<ul style="list-style-type: none">• Regular upgrade procedure• Delete and recreate queues (manually or with AUTOUPGRADEUPD.EXE)	Do not upgrade to HP UPD v5.2 Version v5.1 and higher, use the newer unidrv version. Please test to verify the driver updated correctly.
v5.1	v5.4 or later	<ul style="list-style-type: none">• Regular upgrade procedure• Delete and recreate queues (manually or with AUTOUPGRADEUPD.EXE)	Do not upgrade to HP UPD v5.2
v5.2.x	v5.4 or later	<ul style="list-style-type: none">• Delete and recreate queues (manually or with AUTOUPGRADEUPD.EXE)	See Appendix B: Issues after upgrade from HP UPD v5.2.x
v5.3/ v5.4.x/ v5.5.x/ v5.6.x	Any later version	<ul style="list-style-type: none">• Regular upgrade procedure• Delete and recreate queues (manually or with AUTOUPGRADEUPD.EXE)	
v5.7.x/ v5.8.x/ v5.9.x/ v6.0.x/ v6.1.x/ v6.2.x/ v6.3.x/v6.4.x	Any later version	<ul style="list-style-type: none">• Regular upgrade procedure• Delete and recreate queues (manually or with AUTOUPGRADEUPD.EXE)	

Best practices—upgrade

Reasons to upgrade

Upgrading to the current HP UPD is advised for customers that:

- Need new print driver features introduced in the release.
- Require new product device support.
- Are experiencing symptoms from resolved defects documented in the release notes.
- Require support for recent Microsoft operating system releases. For example, Windows 7 support was added to the HP UPD v5.0; Windows Server 2008R2 support was added in HP UPD v5.1. Windows 8/8.1 and Windows Server 2012/2012R2 support was added in v5.6.0. Windows 10 support was added in UPD 6.1.0 for PCL 6 and PS. Windows Server 2016 support was added in HP UPD 6.4.1.

Predictable upgrades

The most consistent and reliable method to obtain predictable results is creation of new printers using the new driver version, forcing all settings to installation defaults. This can be automated with AUTOUPGRADEUPD.EXE. In addition to the AUTOUPGRADEUPD.EXE, HP has provided several tools in the HP Printer Administrators Resource Kit (HP PARK) to enable deployment and administration. To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

NOTE: For more information on using the HP AutoUpgradeUPD utility, see <http://youtu.be/mYCVx1RBp9w>.

There are separate versions of AutoUpgradeUPD for 32-bit and 64-bit operating systems. AutoUpgradeUPD.exe is for 32-bit operating systems and AutoUpgradeUPD64.exe is for 64-bit operating systems.

Changing PDLs

Do not switch PDLs during the upgrade process. This may result in unpredictable results. If you need to switch PDLs, the best practice is to delete and recreate the printer. For those that choose to switch PDLs during upgrade, PS to PCL 6, or PCL 6 to PS, HP strongly recommends that you delete and recreate the printer.

Testing

HP performs upgrade testing using typical operating systems. Your environment is may be different from our test environments, so HP recommends performing your own upgrade testing in a test environment.

Printer name should be different than the driver name

The printer name is an arbitrary name assigned to identify a print queue. By default, the HP UPD install sets the HP UPD printer name to be the same as the driver name (i.e. "HP Universal Printing PCL 6"). The printer name can be changed without affecting the driver name. HP recommends administrators change the default printer name to not match the driver name. The printer can be viewed, defined, or changed from several access points:

- During installation, such as Add Printer Wizard, the name can be specified, or the HP UPD installation default of "HP Universal Printing [PDL]" or "HP Universal Printing [PDL] (vX.Y.Z)" will be applied. If a printer with the default name exists on the system, "(Copy 1)" will be appended to the HP UPD default name.
- After installation, the printer name can be viewed or changed in the **Printer's** folder by selecting the printer and right mouse clicking **Printer properties**. The **Name** field is located at the top of the **General** tab.

Benefit of using HP UPD version specific driver name installation

For share printers (i.e. print servers) HP recommends implementation of the version specific driver name. The version specific model selection during HP UPD installation allows control over the upgrade and migration strategies. Multiple versions of the HP UPD could exist on the same system. For example v5.9.0, v6.0.0 and v6.3.0 could all co-exist on the same system assuming each was installed choosing the version specific driver name. This benefit allows customers to upgrade drivers for newly released HP devices without having to re-test or re-certify legacy devices for every new release of the driver. For instance, assume a print server has 100 existing printers installed all bound to the v5.9.0 version of HP Universal Printing PCL 6. Further, assume that new HP printers have been purchased and only support v6.3.0 of the HP UPD. The administrator can create new printers using the HP UPD v6.3.0 version specific install without affecting existing printers that use a previous version of the HP Universal Print Driver.

Modify existing HP UPD printer with INSTALL.EXE

The HP UPD install.exe /ni switch processes only the options specified on the installation command line without installing a new HP UPD printer.

Upgrade steps

This section assumes the reader has an understanding of the following:

- [Microsoft Windows Driver Architecture](#)
- [HP UPD installation methods](#)
- [Explanation of driver name](#)
- [Best practices—upgrade](#)

Settings retention

The defined settings retained during an upgrade are dependent upon how the driver was first installed. If the HP UPD was installed in dynamic mode, or traditional mode with the generic printer name "HP Universal Printing PDL," driver settings will be retained during upgrade. If the HP UPD was installed using traditional mode with the version-specific printer name "HP Universal Printing PDL (vX.Y.Z)" settings will not be retained during the upgrade. Those settings not retained will assume defaults of the newly installed driver.

Table 6-2 HP UPD settings retained during upgrade from a non-version specific HP UPD

Shortcuts	PINtoprint
InputBin	HPColorSmart
PrintColorAsGray	Duplex
Orientation	DuplexEdge
NUpChoice	NUpPageOrderChoice
Copies	NUpBordersChoice
MirrorPrint	BookletPrintingChoice
PaperSize	FitToOtherSizeChoice
JobRetentionModeChoice	ScalePageChoice
RequirePINtoprint	Watermarks

Upgrade steps

HP recommends the following steps to upgrade the HP UPD on print servers. These steps complete a sequence of events to ensure the administrator's personal print settings are not applied to the printer during the driver version upgrade, that settings applied become the default settings of the shared printer and Point and Print clients, and all file changes as a result of driver upgrade are completely registered to the system. The steps are not scriptable using supported methods, and dependent upon environment size, which should be accounted for in project planning.

1. Login in using an account with "Manage Printers" permission to the print server (i.e.- the Administrator account, or an account from the Administrator's or Power Users group).
2. From command prompt (**Start-Run**, type cmd, and press Enter).
3. Type the following command at the prompt: control printers and then press Enter.
4. In the **Printers** folder, select the installed printer, right mouse click, and then select either **Properties** or **Printer Properties**.
5. Select the **Advanced** tab.
6. Click **Printing Defaults...**
7. Click the **Printing Shortcuts** tab. Remove all personal shortcuts. If you require custom shortcuts for Point and Print clients, use the HP Driver Configuration Utility (DCU).
8. Within each tab, validate that the defined print settings are the intended defaults for clients receiving point and print vended drivers from this server.
9. Click the **Effects** tab and check the watermarks. Click **Edit** to remove any unwanted watermarks, again validating settings defined will become the default for clients receiving the point and print vended drivers from this server.
10. When the settings have been validated, click the **OK** button, which saves the settings to be used as default settings on the client systems.
11. Log out from Windows, and then log back in with the same account.
12. **Stop and restart the spooler.** From command line type:

```
net stop spooler && net start spooler
```

13. Launch the HP UPD driver installation package. This step only needs to be performed one time for each PDL, regardless of the number of current printers utilizing earlier versions of the HP UPD, either version-specific or non-version-specific driver name.

Result:

- A new printer is created in the printers folder
- The new driver version of the HP UPD has be installed on the system
- Shared dependencies on Unidrv.dll or pscript.dll are updated as determined by the install (see [Microsoft Windows Driver Architecture](#) in chapter 5)

14. **Reboot the system** to force replacement of locked files shared by the Microsoft print system.
15. Assign the newly installed driver version to the existing HP UPD printers.

Example steps provided: From the **Printers** folder, select **Printer Properties** for the HP UPD printer, and click the **Advanced** tab. Change the driver to the newly installed HP UPD version. For example, if the printer name is currently set to "Building 1- Sales Dept", change the **Driver** selection to "HP Universal Printing PCL 6 (v6.0.0)" and click **OK** to assign the printer name to the new driver version.

Delete and recreate queues with AUTOUPGRADEUPD.EXE (traditional mode only)

The delete and recreate queues utility (AUTOUPGRADEUPD.EXE) is included with the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

For more information, see the HP AUTOUPGRADEUPD.EXE Release Notes included in the HP PARK. For more information on the HP PARK in this document, see [HP Print Administrator's Resource Kit \(PARK\)](#) in chapter 4.

The purpose of this tool is to simplify the process of creating clean print queues on a print server. This is useful when upgrading the HP UPD driver version, upgrading an earlier non-HP UPD print queue to use HP UPD, or resetting existing print queues to factory or pre-configured installation defaults. The problem this tool resolves is preventing existing queues from carrying forward unknown, incompatible, and unstable configurations during driver upgrade. The utility accomplishes this by deleting the existing print queue and creates a new print queue using the same printer name, comments, location, and assigned port while applying the specified new driver.

During the print queue delete and recreate process completed by the tool, only the print queue name, port, location, comments, share name, and share state will be retained. All the other settings on the new print queues will be set to factory defaults. If you want to have the new print queues pre-configured to specific settings (e.g. duplex or grayscale), use the HP Driver Configuration Utility (DCU) to pre-configure the driver and create a test queue with the pre-configured settings. Verify that the settings on the test print queue are correct. Upgrade the rest of the print queues using the AUTOUPGRADEUPD.EXE utility, which is designed to use the settings in this test print queue for all the print queues that it re-creates.

NOTE: There are separate versions of AutoUpgradeUPD for 32-bit and 64-bit operating systems. AutoUpgradeUPD.exe is for 32-bit operating systems and AutoUpgradeUPD64.exe is for 64-bit operating systems.

Usage

CAUTION: This utility modifies your system. You are strongly advised to make a system backup before using this utility. In the unlikely event that the upgrade should fail, having a backup will allow you to return to a stable state.

```
AutoUpgradeUPD -o "<old-driver>" -n "<new-driver>" -f "<inf file>" [-s "<server-name>"]
```

Table 6-3 HP AutoUpgradeUPD options

Setting	Description
-s <server_name>	Specifies the name of the failover cluster virtual node that you want to upgrade. If you do not specify a server, the local computer is upgraded. NOTE: This option is not designed for specifying remote servers. The utility is designed to be run directly from the print server, or in the case of a failover cluster, from one of the physical nodes.
-o <old driver>	Utility will attempt to upgrade all print queues that are using this driver. NOTE: Driver names are case sensitive.

Setting	Description
-n <new driver>	Name of the new driver. It is recommended that this driver be pre-installed and tested. NOTE: If the name of the new driver is the same as the name of the old driver, for example HP Universal Printing PCL 6, the new driver must be installed prior to running this utility.
-f <inf file>	Full path to the new driver .inf file
-v	Verbose mode— Displays the printui commands, and other information useful for diagnostic purposes.
-q	Quiet mode—When this option is enabled, error and status dialog boxes are not displayed. NOTE: In some cases, the use of this option will cause the Microsoft printui.dll commands that are used by this utility to fail unexpectedly. If these failures occur, try re-running the utility without this option.
-test	Enumerates printers and outputs messages, but does not perform the upgrade.
-?	Displays help.

Example:

```
AutoUpgradeUPD.exe -o "HP Universal Printing PCL 6 (v5.8.0)" -n "HP Universal Printing PCL 6 (v6.0.0)" -f "E:\UPD Drivers\5.3.1\PCL 6\32\hpcu115c.inf" > Upgrade.log
```

This example will upgrade all the printers that are using HP Universal Printing PCL 6 v5.8.0 to HP Universal Printing PCL 6 v6.0.0, and will log all messages and results into the file upgrade.log

You-Tube Video

For more information on using HP AutoUpgradeUPD, see the You-Tube video “HP AutoUpgradeUPD” at: <http://youtu.be/mYCVx1RBp9w>.

7 Using the HP UPD

Introduction

The HP Universal Print Driver (HP UPD) provides a general-purpose print driver. The look and feel of the HP UPD varies depending on whether it has been installed in dynamic or traditional mode. For more information about installing the HP UPD in these modes, see [Installing and uninstalling the HP UPD](#) in chapter 5.

The following sections describe how to use the HP UPD and its features.

- [Use the HP UPD—traditional mode only](#)
- [Use the HP UPD — dynamic mode only](#)
- [Use the HP UPD — features \(traditional mode and dynamic mode\)](#)
- [Known issues with redirected printers](#)
- [Troubleshooting](#)
- [Frequently Asked Questions](#)

Using the HP UPD—traditional mode only

HP UPD traditional mode

When installed in traditional mode, the HP UPD behaves as a product-specific driver, associated to a specific printer with a permanent instance of the driver in the **Printers** folder. You can install traditional mode printers in various ways, including using the **Add Printer Wizard** in the **Printers** folder or by using INSTALL.EXE.

Print using the HP UPD in traditional mode

Printing using the HP UPD depends on the installation mode of the HP UPD.

An HP UPD installed in traditional mode behaves similar to a product-specific driver. The HP UPD behaves according to the driver features available for the product to which the driver is attached.

1. In the application, click **File**, and then click **Print**.
2. The application's **Print** dialog box opens. Select the printer from the list of available printers.
3. Click **Properties** and modify the driver features as needed. (For example, select the **Finishing** tab and select **Print on both sides**.)

Click **OK** when you are finished modifying settings.

4. Click **Print**.

Using the HP UPD — dynamic mode only

HP UPD dynamic mode

When installed in dynamic mode, the HP UPD can print to any supported HP printer within any network print environment without installing several product-specific drivers. An HP UPD installed in dynamic mode allows the most flexibility. The HP UPD discovers the product capabilities so that users can print using most product capabilities, including advanced printing options such as watermarks and booklet printing.

After discovering a printer with the HP UPD in dynamic mode, it is possible to create a permanent instance of the discovered printer. This creates a new print queue and makes the newly created print queue display in the U/I like a traditional print driver. You can install the HP UPD in dynamic mode by using INSTALL.EXE.

NOTE: Dynamic mode is not supported in point and print operations or terminal server sessions. In Windows 8 and later Windows operating systems, dynamic mode is only supported in desktop applications.

Dynamic mode offers a unique, easy-to-use user interface that steps the user through the printer discovery and selection process. By default, the user can find a printer by the printer address (IP address or hostname), by searching for a network printer, or searching for printer shares. Printers which have been used before will be displayed in the Recently Used Printers list. Administrators can add a pre-defined printer list for the HP UPD in dynamic mode.

The HP UPD in dynamic mode requires user interaction with every print job because it presents the user with a dialog box for the selection of the printer. This interaction can be minimized by changing the settings for dynamic mode (see [Configure HP UPD dynamic mode settings](#) in this chapter).

Advanced features available for the HP UPD allow an administrator to offer pre-defined printer lists and control of the available search options using the HP Active Directory Administrator Template.

The following information describes the driver in dynamic mode unless otherwise stated.

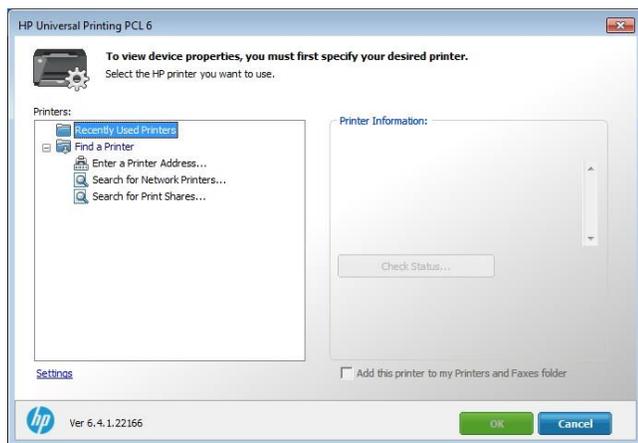


Figure 7-1 HP UPD Dynamic Mode dialog box

Print using the HP UPD in dynamic mode

Printing using the HP UPD depends on the installation mode of the HP UPD.

HP UPD installed in dynamic mode functions within the constraints established by the administrator to manage the printer. If a feature does not behave normally, the administrator might have limited the functionality.

When the HP UPD is installed in dynamic mode, it displays as a typical printer in the user's **Printers** folder. Dynamic mode provides a unique interface to users allowing them to instantly locate and connect to printers on the fly.

Search for printers using any of these methods:

- Enter a printer address.
- Search the local subnet for printers.
- Enter the name of a print share.

The next section details each of the dynamic mode options. Printers found via dynamic mode are temporary connections and do not appear individually in the **Printers** folder. Dynamic mode installation of the HP UPD does not require the user to have any elevated rights or printing permissions, allowing the existing user permissions to remain intact.

NOTE: Dynamic mode is supported in Direct IP and local printing only and is not supported as shared printers on print servers at any time. . In Windows 8 and later Windows operating systems, dynamic mode is only supported in desktop applications.

Dynamic mode options—Default configuration

By default, the name of the dynamic mode print queue created is the same as the name of the driver. In the case of PCL 6, the default queue name is HP Universal Printing PCL 6. This name can be changed during installation, or renamed to something more descriptive like “Search for a Printer”.

NOTE: The printer name can be changed in the printers folder after the driver is installed.

Using dynamic mode

1. From an application, click **File** and then **Print**.
2. In the application's **Print** dialog box, select the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**) and click **Print**. The **HP Universal Printing** dialog box opens.
3. For the quickest way to print, select a printer from the **Recently Used Printers** list, and then click **Print**.

If no printer is available in the **Recently Used Printers** list, or if you prefer to find a different printer, you can find a printer immediately by using one of the options under **Find a printer**.

Selecting a recently used printer

The **Recently Used Printers** list contains all the products to which the HP Universal Print driver has recently printed. After you have selected which recently used printer to use, click **Print**.

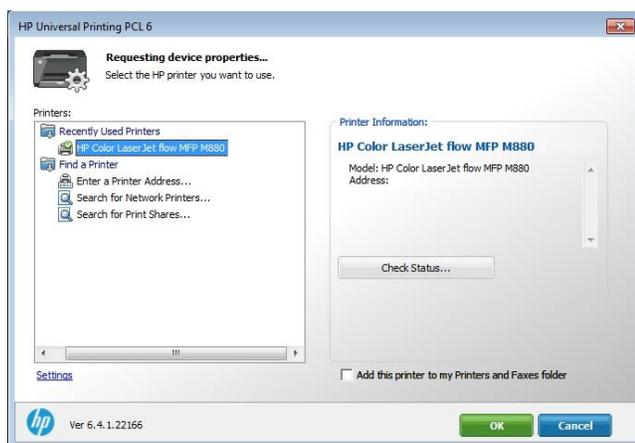


Figure 7-2 HP UPD Dynamic Mode dialog box with a Recently Used Printer

Additional options:

To verify whether this printer contains the necessary supplies for the print job before printing, click the **Check Status** button.

To add a recently used printer to the **Printers** folder, select the **Add this printer to my Printers and Faxes folder** option. This option allows you to print directly to this printer rather than accessing it through the **HP UPD Dynamic mode** dialog box.

NOTE: Beginning with HP UPD v4.7, elevated rights are not required to create a permanent instance of the selected printer. Restricted or “locked down” users can create traditional mode queues from within the dynamic mode user interface.

Configure HP UPD dynamic mode settings

The processes for entering the **Dynamic** mode U/I and changing the default behavior is outlined below.

1. To gain access to the settings of the HP UPD in dynamic mode, do the following:

When using the Printers folder:

- a. Click **Start** and then **Devices and Printers**.
- b. In the **Print** dialog box, right click the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**).
- c. Click **Printer properties** or **Printing preferences**. The **HP UPD Dynamic mode** dialog box displays.

When printing from an application:

- a. In the **Print** dialog box, select the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**).
- b. Click **Properties** or **Printer Properties**. The **HP UPD Dynamic mode** dialog box displays.

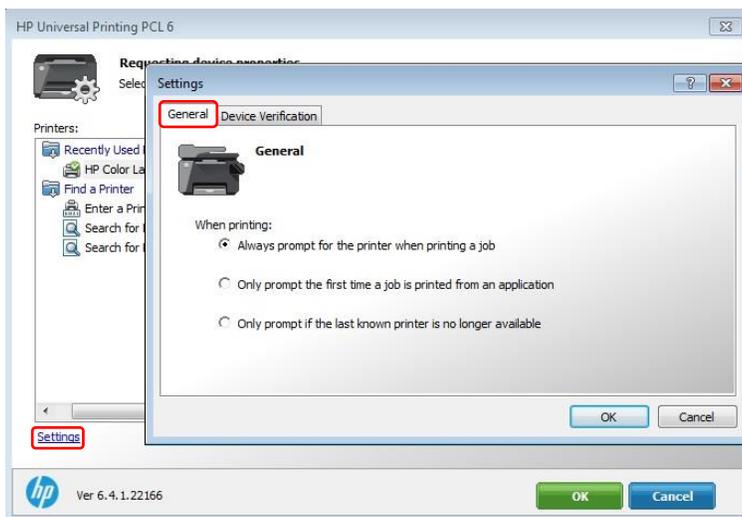


Figure 7-3 HP UPD Dynamic Mode dialog box Settings General tab

2. Click **Settings**. There are two tabs in the settings screen: **General** and **Device Verification** tabs.

General tab—To specify if and when you will receive the **HP UPD Dynamic mode** dialog box when you are printing, select one of the following options:

- Always prompt for the printer when printing a job.

The **HP UPD Dynamic mode** dialog box displays every time HP Universal Printing is the selected printer. You can select a destination printer in this dialog box.

- Only prompt the first time a job is printed from an application.

The **HP UPD Dynamic mode** dialog box displays the first time HP Universal Printing is selected as the printer from an application. This option is helpful if other print jobs from that application are sent to the same printer by reducing the number of key clicks required by the user.

- Only prompt if the last known printer is no longer available.

The **HP UPD Dynamic mode** dialog box displays if the last used printer is no longer available.

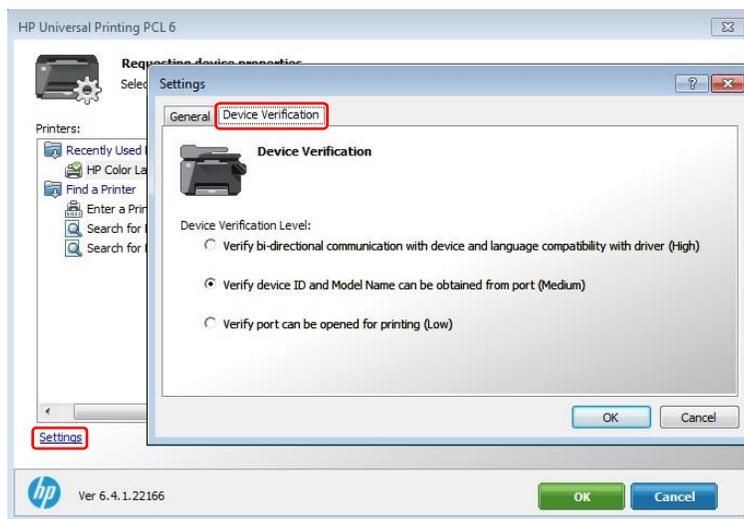


Figure 7-4 HP UPD Dynamic Mode dialog box Device Verification tab

Device Verification tab—To set the level of verification required to allow printing, select one of the following in the **Device Verification** tab:

- Verify bidirectional communication with device and language compatibility with driver (High) to block printing if bidirectional communication and language compatibility cannot be verified.
- Verify if Device ID and Model Name can be obtained from port (Medium) to block printing if the Product ID and Model Name cannot be verified. Medium is the default setting.
- Verify port can be opened for printing (Low) to allow printing (but issue a warning message) if the port can be opened for printing.

3. Click **OK**.

Find a printer in dynamic mode

From the **HP UPD Dynamic mode** dialog box, you can find a printer locally or on the network and print to it.

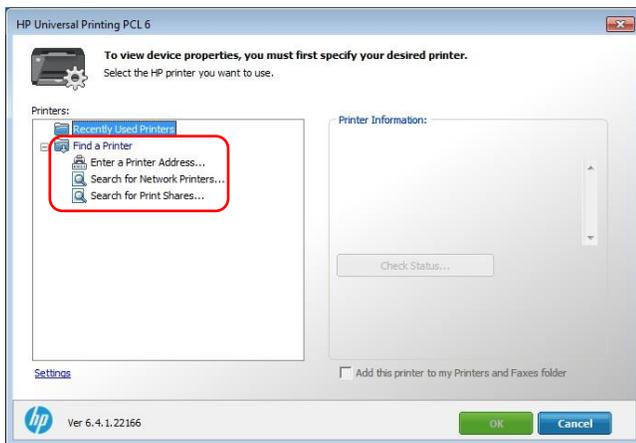


Figure 7-5 HP UPD Dynamic Mode dialog box Find a Printer

The following methods for locating and connecting to a printer are available:

- **Enter a printer address**—Recommended if the IP address, host name or UNC path is known or if you want to use a printer that is outside your local subnet.

NOTE: To determine the printer address, print a configuration page from the printer.

- **Search for network printers**—Recommended if you do not have the printer address for a printer or if you want to see what products are available on your subnet. This feature uses a local subnet broadcast known as Multicast DNS (mDNS) and is similar to the Bonjour or Rendezvous protocol.

For Devices to show up in the Network Printers list, the following requirements must be met:

- The printer must be on the same subnet as the PC running dynamic mode.
- mDNS, TCP/IP v4 protocol, and port 9100 printing must be enabled.

NOTE: The printer list returned represents the list of printers available on the local subnet. The information for each printer by default represents the mDNS service name and is a text field that can be changed to provide more descriptive information for the users.

- **Search for print shares**—Recommended if you want to view shared printers on the network or products that use a print server.

NOTE: The above are all default options. Other options might be available depending on the print policies created by your system administrator. Contact your system administrator for more information about these options.

Enter a print address (dynamic mode)

NOTE: To determine the printer address, print a configuration page from the printer.

1. From your application, select **File** and then **Print**.
2. In the **Print** dialog box, select the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**) and click **Print**. The **HP UPD Dynamic mode** dialog box opens.
3. Click **Enter a printer address**.

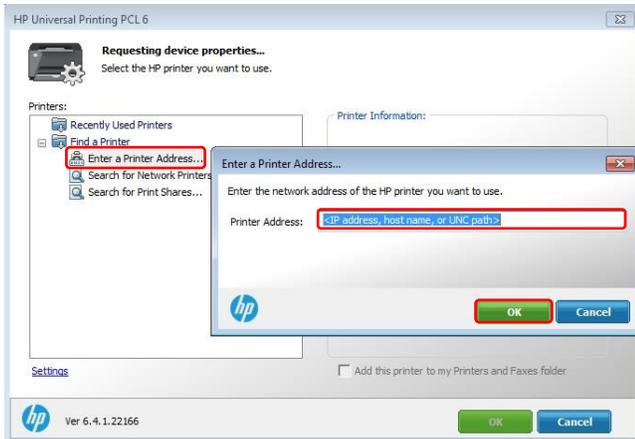


Figure 7-6 HP UPD Dynamic Mode dialog box Enter a Printer Address

4. Type the printer address (IP address, host name, or UNC path) and click **OK**.
 - If the printer address is found, the printer is displayed under the Printer Information pane on the right side of the dialog box.
5. To verify the status of the printer or whether the printer contains the necessary supplies for the print job before printing, click the **Check Status** button.

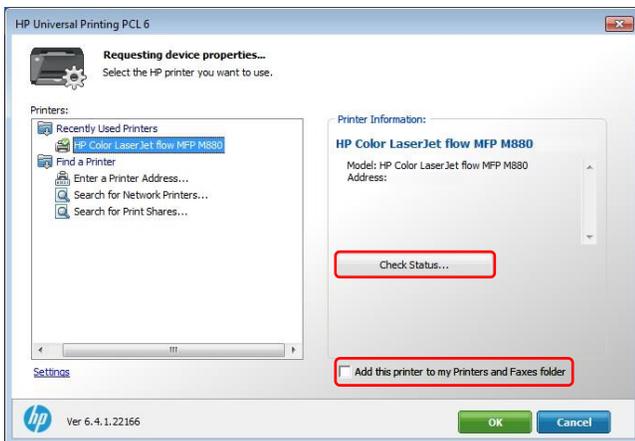


Figure 7-7 HP UPD Dynamic mode dialog box

6. To add the currently selected printer to the Printers folder as a traditional mode print queue, select the **Add this printer to my Printers and Faxes folder** option (see [Figure 7-7 HP UPD Dynamic mode dialog box](#)).
 - This option allows you to print directly to this printer rather than accessing it through the **HP UPD Dynamic mode** dialog box. Adding a traditional mode printer via dynamic mode does not require the user to have elevated rights.
7. Click **Print**

Search for network printers (dynamic mode)

When selecting **Search for Network Printers**, the HP UPD uses the mDNS protocol to discover products on the local subnet only. This means that only products on the same subnet as the HP UPD will be displayed in the list. mDNS, or Multicast DNS is also known as the Bonjour protocol.

1. From your application, select **File** and then **Print**.
2. In the **Print** dialog box, select the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**) and click **Print**. The **HP UPD Dynamic mode** dialog box opens.
3. Click **Search for network printers**. The available printers appear under **Printers** in the **Search for network printers** dialog box.

If necessary, click **Refresh** to update the list.

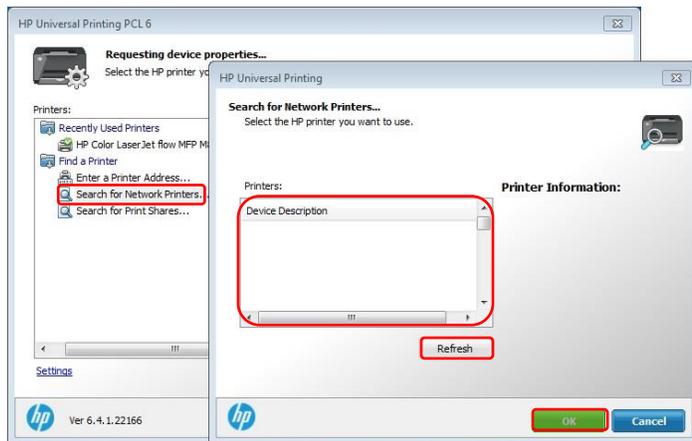


Figure 7-8 HP UPD Dynamic mode dialog box

4. Select the desired printer in the **Printers:** list. The selected printer is displayed under the **Printer Information** dialog box.
5. Click **OK** to return to the main dynamic mode dialog box. The selected printer also displays on the right side of the pane under **Printer Information**.
6. To verify whether this printer contains the necessary supplies for the print job before printing, click the **Check Status** button as shown in figure 7-7.
7. To add a recently used printer to the **Printers** folder, select the **Add this printer to my Printers folder** option as shown in figure 7-7.
 - This option allows you to print directly to this printer rather than accessing it through the **HP UPD Dynamic mode** dialog box.
8. Click **Print**

Search for print shares (dynamic mode)

1. From your application, select **File** and then **Print**.
2. In the **Print** dialog box, select the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**) and click **Print**. The **HP UPD Dynamic mode** dialog box opens.
3. Click **Search for print shares**.

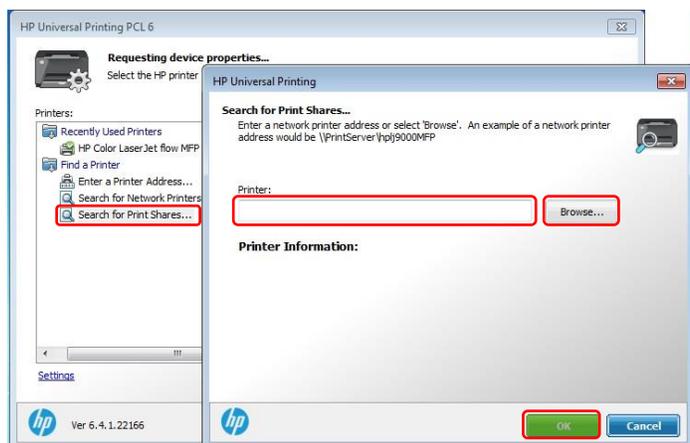


Figure 7-9 HP UPD Dynamic mode dialog box

4. Enter the network printer address, example `\\servername\sharename` or click **Browse** to browse the network for shared printer resources, a print share, or a shared printer.
5. Click **OK**. The printer displays under the Search for print shares option.
6. To verify whether this printer contains the necessary supplies for the print job before printing, click the **Check Status** button as shown in figure 7-7.
7. To add a recently used printer to the Printers folder, select the **Add this printer to my Printers folder option** as shown in figure 7-7.
 - This option allows you to print directly to this printer rather than accessing it through the HP Universal Printing dialog box.
8. Click **Print**.

Add a printer to the Devices and Printers folder (dynamic mode)

Use the **HP UPD Dynamic mode** dialog box to add a printer to the **Printers** folder while printing from a program or from within the **Printers** folder.

NOTE: When a printer is created using the **Add Printer Wizard**, or from within the dynamic mode U/I screen, a traditional mode version of the HP UPD is created for the printer. This means that both traditional mode and dynamic mode queues can be used on the same system. Also, when a printer is created from dynamic mode, the new traditional mode print queue takes on the same driver PDL: version as the dynamic mode queue. This means that if PCL 6 is used for the dynamic mode queue, then the traditional mode print queues created from this will also be using the PCL 6 version of the driver.

Add a printer to the Printers folder using the dynamic mode user interface.

1. In the software program, click **File** and **Print**.
2. In the **Print** dialog box, select the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**) and click **Print**. The **HP UPD Dynamic mode** dialog box opens.
3. To add a previously used printer, select one of the printers in the **Recently Used Printers** list.

- To discover a printer to add, select one of the following options under **Find a printer**:
 - Enter a printer address.** Type the IP address, host name, or UNC path, and click **OK**.

NOTE: To find the printer address of a printer, print a configuration page.

- Search for network printers.** Select one of the printers listed and click **OK**.
- Search for print shares.** Type the network printer address or click **Browse** to browse to the printer. Click **OK**.

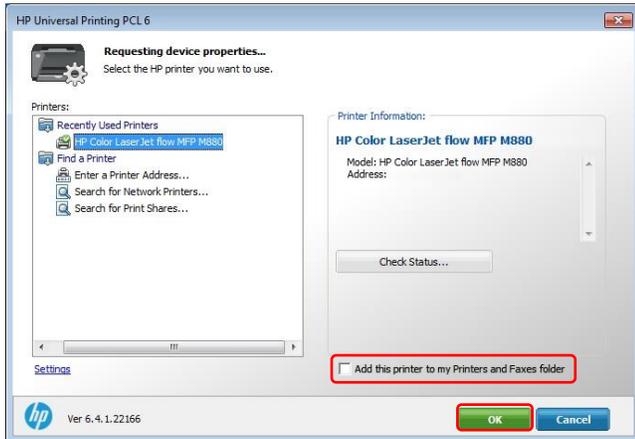


Figure 7-10 HP UPD Dynamic mode dialog box

- Select **Add this printer to my Printers and Faxes folder**.
- Click **OK**.

Add a printer to Devices and Printers folder from within the Devices and Printers folder (dynamic mode)

- In the Printers folder, right-click the Dynamic print queue (**HP Universal Printing PCL 6** or **HP Universal Printing PS**) and select Properties or Printing Preferences. The **HP UPD Dynamic mode** dialog box opens.
- To add a previously used printer, select one of the printers from the Recently Used Printers list.
- To discover a printer to add, select one of the following options under Find a printer:

- Enter a printer address.** Type the IP address, host name, or UNC path, and then click **OK**.

NOTE: To find the printer address of a printer, print a configuration page.

- Search for network printers.** Select one of the printers listed and click **OK**.
 - Search for print shares.** Type the network printer address or click **Browse** to browse to the printer. Click **OK**.
- Select **Add this printer to my Printers and Faxes folder** as shown in figure 7.10.
 - Click **OK**.

Organize the Recently Used Printers list (dynamic mode)

The products listed under the **Recently Used Printers** list can be organized by deleting products, moving products into folders, and creating new folders.

NOTE: By default, no folders are listed under the **Recently Used Printers** list.

Add a new folder

1. Right-click **Recently Used Printers** and select **New Folder**.
2. In the New Folder dialog box, type a name for the folder, and click **OK**. The folder displays under Recently Used Printers.

Move devices into folders

- Drag and drop the printers you want to move into the desired folder.
- Right-click the printer to move, select **Move to Folder**, and select the desired folder.

To delete a printer or a folder, right-click the printer or folder and click **Delete**.

Using the HP UPD features (traditional mode and dynamic mode)

Change Print Driver Settings

To gain access to printer driver settings from within most software applications, click **File**, click **Print**, and then click **Properties** or **Preferences**. The appearance and names of the driver tabs that appear can vary depending on the operating system, specific printer, and paper handling options. These settings apply only while the software application is open.

You can also control the driver directly from the **Printers** folder. These settings change the default settings for all software applications.

1. Click the Windows icon in the lower-left corner of the screen, and then click **Devices and Printers** to open the Printers folder.
2. Right-click the print queue for the printer.
3. Click **Printing preferences** to gain access to the same set of driver tabs that the software application controls.

Device mode versus Capabilities mode

Up until recently, the HP UPD would query the printer and the printer would return device information about the printer such as the model number of the printer and the model number of input and output devices, as well as other accessories. The driver would then map the device information to settings in the driver. Starting with HP UPD 6.4.1 and the HP LaserJet MFP E725xx, E825xx, E778xx and E876xx printers releasing in spring 2017, the printer returns the capabilities of the device to the print driver versus the device information.

One way to think of this is to look at it as two modes, Capabilities mode and Device mode, to differentiate between how releases of the firmware and HP UPD communicate device features. Device mode is how prior releases of the firmware shared device information with HP UPD such as printer part numbers and model numbers with the HP UPD mapping the device information to settings in the driver. Capabilities mode, which was introduced in HP UPD 6.4.1 and the HP LaserJet MFP E725xx, E825xx, E778xx and E876xx printers, enables firmware on supported devices to share the capabilities of the device and input/output devices with the HP UPD to configure settings directly in the HP UPD.

NOTE: Whether the firmware and driver use Device mode versus Capabilities mode is dependent on the printer firmware and version of the HP UPD. If Capabilities mode is supported by the firmware, HP UPD 6.4.1 and later will use Capabilities mode to configure the driver. To verify which mode is supported, open the Device Settings tab in Printer Properties and see whether **Accessory Output Bin** or **Optional Output Bin** is listed. If **Accessory Output Bin** is displayed, the driver is using Device mode. If **Optional Output Bin** is displayed, the driver is using Capabilities mode.

By standardizing the capabilities, the Capabilities mode sends the capabilities of the printer and input/output devices, reducing the dependency on Hardware IDs.

If Capabilities mode is not available, device information is shared between firmware and the HP UPD, and the HP UPD maps the device information to capabilities or settings in the HP UPD. If Capabilities mode is available, the capabilities information is shared between firmware and the HP UPD without the need to map device information to settings.

NOTE: With Bidi disabled (such as SNMP disabled), or not pointing at an actual device, even with HP UPD 6.5.0 or later, and printer Capabilities mode, the print queue has no way to determine the type of device or available features. With Bidi disabled (and/or not pointing at an actual device) using DCU or a reference device to configure the queue, the print queue only knows the features based on the DCU settings or reference device connected originally. The queue has no way of knowing which product or type of product it is actually printing to.

NOTE: AD templates, DCU and DDU are designed for the HP V3 UPD such as HP UPD 6.5.0 and do not support newer discrete (printer specific) drivers for Windows 7 and later operating systems.

Printing Preferences Tab Set

The **Printing preferences** tabs contain options for formatting documents for the printer. Gain access to the **Printing Preferences** tabs either through the software program or through the Windows **Printers** folder.

The following tabs may be included in **Printing Preferences** tab set depending on capabilities and accessories in the currently selected printer:

- Advanced
- Printing Shortcuts
- Paper/Quality
- Effects
- Finishing
- Output
- Job Storage
- Color
- Services

NOTE: The Color tab is only available for printers that support color. Settings on the Output tab vary depending on which paper handling options are installed.

Advanced Tab Features

Use the **Advanced** tab to change the layout of printed pages, and configure special controls that are not commonly used, as well as to control features such as collating and copies in the driver.

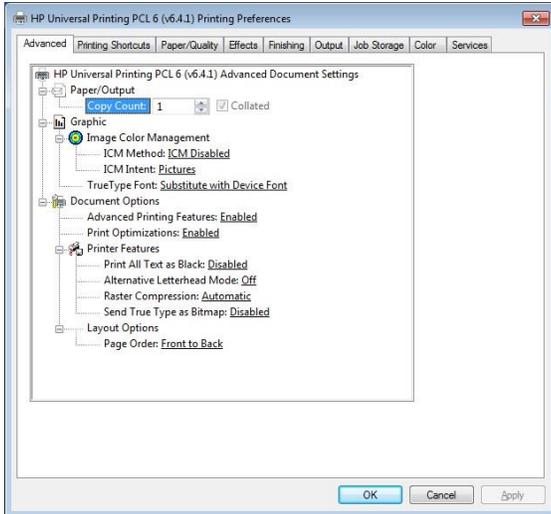


Figure 7-11 Advanced Tab for PCL

Table 7-1 Advanced Tab Features

Feature	Function
Paper/Output	<p>Copy Count -- Specifies the number of copies to print.</p> <p>This driver setting is useful for software programs that do not provide a copy count. If a copy count is available in the software program, set the copy count in the software program.</p> <p>Valid entries are numbers from 1 to 9999. When you click another group box or leave the Advanced tab, invalid entries are changed to the last valid value that appeared in the text box. The default number of copies is 1.</p> <p>In most cases, the software program and the driver communicate, so that the number of copies set in one location (such as the program) will appear in the other (such as the driver). For some programs, this communication does not take place, and the copies values are treated independently. For these programs, setting 10 copies in the program and then setting 10 copies in the driver will result in 100 copies (10 x 10) being printed.</p>
	<p>Collated – When the Copy Count option is set to more than 1, the Collated check box becomes available.</p> <p>Select this check box when you want the printer to collate (collect and combine in proper order) the printed copies.</p> <p>Most current software programs support the collating feature in the print dialog box or through the page settings in the software program.</p>

Feature	Function
Graphic	<p>Image Color Management -- (ICM) options are used for printing color graphics. The ICM options make it possible for programs to adjust colors before printing so that the color of images on the screen more closely matches the color of printed images. The following options are available:</p> <p>ICM Method – This setting specifies how to print color graphics. The default setting for ICM Method is ICM Disabled. Additional options on the ICM Method drop-down menu include:</p> <ul style="list-style-type: none"> • ICM Handled by Host System -- Click this option to perform calculations for color matching on the host computer before sending the document to the printer. • ICM Handled by Printer. Click this option to perform calculations for color matching on the printer. A set of rules for mapping the colors is created and downloaded to the printer (which must be PostScript language level 2 or higher). The printer uses these rules to adjust colors in the document. <p>ICM Intent -- This setting specifies how color images are created to produce the best-looking image on the printed page.</p> <ul style="list-style-type: none"> • If printing a chart or using fully saturated, bright colors, click Graphics to achieve the best quality. • For photographs or pictures where the colors blend together, click Pictures to maximize the contrast (default). • If the document uses a color that you need to match exactly, and you are sending the document to a printer that has that specific color of ink, click Proof. • To preview the color settings from another printer, click Match. <p>True Type Font -- Use Substitute with Device Font (the default setting) to print documents that contain TrueType fonts by using equivalent printer based fonts. This permits faster printing; however, you might lose special characters that the equivalent printer based font does not support.</p> <p>Select Download as Soft font to download TrueType fonts for printing instead of using printer based fonts.</p>
Document Options	<p>Advanced Printing Features -- When this setting is Enabled, metafile spooling is turned on and Finishing tab options such as Page Order, Booklet Layout, and Pages per Sheet are available, depending on your printer.</p> <p>Enhanced metafile spooling is used to greatly reduce the amount of time that elapses between a request to print (initiated by an application) and the return of control to the application by the operating system.</p> <p>For normal printing, leave the Advanced Printing Features setting at the default (Enabled). If compatibility problems occur, you can disable the feature. However, some advanced printing features might still appear in the print driver, even though they have been disabled. If you select an advanced printing feature in the print driver that has been disabled on the Advanced tab, the feature is automatically re-enabled.</p> <p>Print Optimizations -- When this feature is Enabled (default setting) and your document contains overlapping text and graphics, the text that is placed on top of a graphic might not print correctly. If the printed output is not correct, you can disable this feature.</p> <p>When this feature is disabled, print optimization-features, such as substituting device fonts for TrueType fonts and scanning for horizontal and vertical rules are turned off.</p>

Feature	Function
	<p>Printer Features: Print All Text as Black -- The feature is Disabled by default. When Enabled, the driver prints all text as black regardless of the original document text color.</p> <p>Color text is printed as black, except for white text, which remains white. (White text is a reliable method of printing reverse typeface against a dark background.)</p> <p>This setting does not affect graphic images on the page or any text that is part of a graphic.</p> <p>Printer Features: Alternative Letterhead Mode -- When selected, this option eliminates the need to flip or reload letterhead or preprinted paper in a tray, whether you are printing on one or both sides of the sheet.</p> <p>Load the paper as you would for printing on both sides. If the printer tray has an icon that indicates whether to load paper either face-up or face-down, load the paper in opposite orientation of what is shown.</p> <hr/> <p>NOTE: Alternative Letterhead Mode is available only if the printer is equipped with an automatic duplexing unit.</p> <hr/> <p>Printer Features: Raster Compression (PCL) -- This option is used for compressing graphics.</p> <ul style="list-style-type: none"> • Automatic -- The default setting. When this option is selected, the printer driver determines the best compression method to use. • Best Quality -- Forces the driver to use a compression method that results in no loss of data during compression. • Maximum Compression -- Where applicable, requires the printer driver to use a compression method that maximizes compression. This setting can result in a loss of quality in the printed output. <p>Printer Features: Send True Type as Bitmap (PCL) -- Provides an alternative for software programs that have trouble using TrueType fonts for special graphic aspects such as shading, rotation, or slanting.</p> <ul style="list-style-type: none"> • Enabled -- TrueType fonts are converted to bitmap soft fonts before downloading. • Disabled -- TrueType fonts are sent to the printer as outlines, which retains the standard format (outline) of the fonts. Disabled (off) is the default. <p>Layout Options: Page Order -- Specifies the order in which the pages of your document are printed.</p> <ul style="list-style-type: none"> • Front to Back prints the document so that page 1 prints first (default). • Back to Front prints the document so that page 1 prints last. <hr/> <p>NOTE: The page-ordering operation works on whole sheets of paper rather than on individual logical pages. Accordingly, if you set Pages per Sheet (on the Finishing tab) to be greater than one, the ordering of logical pages on a physical sheet of paper does not change.</p>
Document Options: Postscript Options	<p>PostScript Output Option -- Specifies the output format for PS files.</p> <ul style="list-style-type: none"> • Generally, use the default setting, Optimize for Speed, to print the documents. • Optimize for Portability -- To create a file that conforms to the Adobe Document Structuring Conventions (ADSC). Each page of the document will be a self-contained object. This is useful when creating a PS file and printing it on a different product. • Encapsulated PostScript (EPS) -- To include the file as an image in another document that is printed from a different software program. • Archive Format -- To create a PS file that can be used later.

Feature	Function
	<p>TrueType Font Download Option -- Specifies how TrueType fonts are downloaded.</p> <ul style="list-style-type: none"> • Automatic (Default Setting) -- Allows HP UPD PS to decide which format is best. • Outline -- Downloads the TrueType font as a scalable outline font. • Bitmap -- Downloads the TrueType font as a bitmap font. • Native TrueType -- If the product is a TrueType rasterizer printer, select this setting to download the TrueType font as an outline font. <p>PostScript Language Level -- Specifies which PS language level to use, from 1 to 3. The highest level supported by current HP LaserJet printers is 3. Some products support multiple levels.</p> <p>It is usually best to select the highest number available, because a higher language level provides more features. In some instances level 1 should be used, such as when printing a file to disk where that file will be printed by someone who uses a level-1 product.</p> <p>Send PostScript Error Handler -- specifies whether a PS error-handler message is sent. To get the product to print an error page when an error occurs in the print job, click Yes. The default setting is Yes.</p>

Printing Shortcuts Tab Features

Printing Shortcuts saves commonly used driver settings under a shortcut name.

Shortcuts created from the application level against the applied Unlocked policy will show the saved settings only from the application level. From the Devices and Printers folder, those newly created shortcuts will always show the settings applied via policy.

NOTE: The number of options shown (**Paper sizes**, **Paper source**, etc.) changes depending on the selected shortcut and device capabilities.

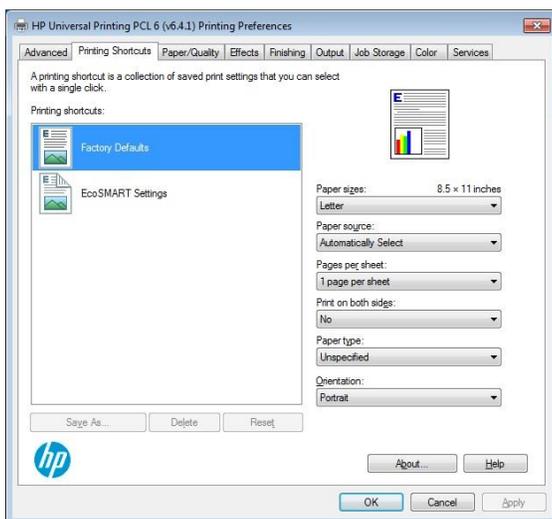


Figure 7-12 Printing Shortcuts Tab

Use defined printing shortcuts

The following defined printing shortcuts are available:

- **Factory Defaults** – Select this option to return to the factory default settings.
- **EcoSMART Settings** -- Select this option to print using typical settings for duplex printing.

NOTE: If you change any of the settings for a defined printing shortcut, the **Save As...** and **Reset** buttons become active. Click **Save As...** to save the new settings as a custom printing shortcut. Click **Reset** to return to the default options for all features of the selected shortcut.

Create a custom printing shortcut

1. Select **Factory Defaults** as a base.
2. Select the appropriate print settings on the **Printing Shortcuts** tab.
3. On the **Printing Shortcuts** tab, click **Save As...** The **Printing Shortcuts** dialog box appears.
4. Type a name for the custom printing shortcut, and then click **OK**. The custom printing shortcut appears in the Printing Shortcuts list.
5. To delete a custom printing shortcut, click the custom shortcut, and then click the **Delete** button.

NOTE: Predefined shortcuts are designed for using as-is, or as bases for custom printing shortcuts, and cannot be deleted.

Paper/Quality Tab Features

Use the **Paper/Quality** tab to specify paper size, type, and source, as well as to specify different paper selections for the front cover, first page, last page, and back cover of the document.

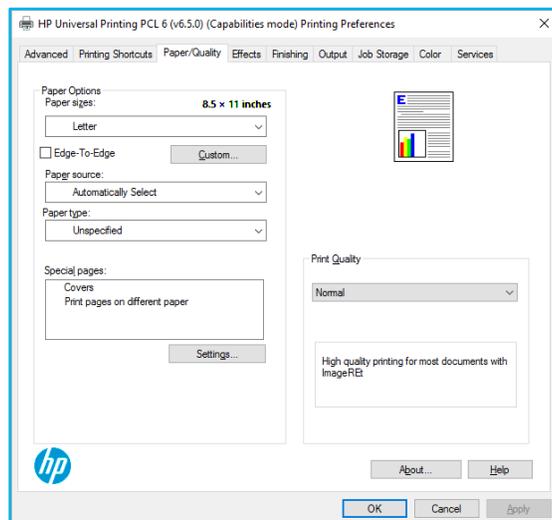


Figure 7-13 Paper/Quality Tab

NOTE: Gloss Level is not supported with Capabilities mode. Edge-To-Edge is only supported on printers that support both Edge-To-Edge and Capabilities mode.

Table 7-2 Paper/Quality Tab Features

Feature	Function
<p>Paper Options</p>	<p>Paper sizes -- A drop-down menu that lists all of the supported paper sizes for a specific printer.</p> <p>When you move the mouse over the dimensions label, the mouse cursor changes from an arrow to a gloved hand. Click the dimensions label to toggle between English and metric units.</p> <p>Paper-size settings in most software programs override driver settings. Use the driver to set paper size only when you are printing from software programs that do not include a paper-size setting, such as NotePad, or when you are producing a book or a booklet.</p> <hr/> <p>NOTE: Certain software programs can override the size command and specify different paper sizes within a single document.</p> <hr/> <p>If you change the print-driver setting to a paper size that is not currently loaded in the printer, a control-panel message appears that prompts you to load the paper size or select another tray.</p>
<p>Paper Options: Custom</p> <p>The Custom Paper Size dialog box appears when you click Custom... on the Paper/Quality tab.</p> <hr/> <p>NOTE: Adding custom paper sizes requires administrator privileges on the operating system.</p>	<p>Name -- Type in a new name for a custom paper size. When you change the name to something other than Custom, the Save and OK buttons become active.</p> <p>The name that appears in the Name text box depends on the following conditions:</p> <ul style="list-style-type: none"> • If a saved custom paper size has been selected from the drop-down menu on the Paper/Quality tab, then the Name text box shows the name of the selected custom paper size. • If a standard paper size has been selected on the Paper/Quality tab, then the Name text box shows the default name of Custom. • If a new name has been typed into the Name text box for the purpose of saving a new size or renaming an existing size, then that new name will remain in the text box until the new size is saved or the dialog box is closed. <p>If you type a new name into the Name text box, but then do not click Save, you can change the width and height values without losing the name. However, if you close the dialog box without clicking Save, any unsaved name or size values are lost.</p> <hr/> <p>Paper size -- The width and length values can be changed by typing numeric strings into the edit boxes in the Paper Size group box.</p> <hr/> <p>NOTE: The range of supported custom paper sizes varies between printer models. See the user documentation for your printer for the supported range of custom paper sizes.</p> <hr/> <p>Any entry that is greater than the maximum limits of the width and length control is rounded down to the maximum valid entry. Any entry that is smaller than the minimum limits of the width and length control is rounded up to the minimum valid entry.</p> <p>If units are in millimeters, the custom paper-size range minimum is the limit rounded up to the nearest whole millimeter. The custom paper-size range maximum is the limit rounded down to the nearest whole millimeter.</p> <p>Any non-numerical entry reverts to the minimum value.</p> <p>The resolution of each control is 1 millimeter or 1/10 of an inch, depending on the current measurement units.</p>

Feature	Function
	<p>Units -- To change measurement units, click one of the options in the Units group box (Inches or Millimeters).</p>
<p>Paper Options: Edge-To-Edge</p>	<p>Edge-To-Edge – Select this option to print a document with 2 mm margins on supported devices. If this option is not selected, the document will be printed with standard margins.</p> <p>This feature is auto configurable in the Printer Properties Device Settings tab. By default it is set to automatic.</p> <hr/> <p>NOTE: Edge-To-Edge is only supported on printers that support both Edge-To-Edge and Capabilities mode.</p> <hr/>
<p>Paper Options: Paper source</p>	<p>Paper source -- Specifies the source tray to use for printing a document. The list of source trays depends on the printer model and accessories that are installed. Any optional source trays that are installed through the Device Settings tab also appear here.</p> <p>The Paper source drop-down menu can contain the following options, depending on what has been installed on the printer:</p> <ul style="list-style-type: none"> • Automatically Select • Printer auto select • Manual Feed • Tray 1 through Tray 4 <p>The default setting is Automatically Select. When this setting is selected, the printer uses the source tray that supports the paper size that you have selected.</p> <p>If you select a source tray other than Automatically Select, make sure that the correct paper size is loaded in the source tray.</p>
<p>Paper Options: Paper type</p>	<p>Paper type -- This drop-down menu shows Unspecified and an entry for More. Clicking More opens the Type is dialog box. Expand Type Is and its subcategories to view all of the paper types that the printer supports. The default setting is Unspecified.</p> <p>If you select a setting other than the default, make sure that the correct paper type is loaded in the tray that you selected in the Paper source setting.</p> <p>When you change the print-driver setting to a paper type that is not currently loaded in the printer, a control-panel message appears prompting you to load the paper type or select another tray.</p> <hr/> <p>NOTE: No mechanism exists for manually adding custom paper types through the driver.</p> <hr/>

<p>Paper Options: Special Pages</p> <hr/> <p>NOTE: The selections for special pages may vary between printer models. See the user documentation for your printer for the supported range of custom paper sizes.</p>	<p>Settings – Click Settings to access the Special Pages dialog box.</p> <p>Covers -- Includes a blank or preprinted cover on a document, or includes a front/back cover from a source tray that is different from the one used for the remainder of the document. The following options are available:</p> <ul style="list-style-type: none"> • Add a blank or preprinted cover: Select which cover is customized: Front, Back, or Both. • Paper source: Specifies the source tray to use for adding a front and/or back cover to the document. The list of source trays depends on the accessories that are installed. Any optional trays that are installed through the Device Settings tab also appear here. • Paper type: Specifies the paper type to use for front and/or back covers. Changes made to the Paper type setting here override any previous Paper type settings using the same paper source. <hr/> <p>NOTE: The same size of paper will be used for the entire print job.</p> <hr/> <p>When you change the type and source of the paper and covers, the settings remain configured until you close the software program.</p> <hr/> <p>Print pages on different paper -- Select an alternative paper type or source for the first or last pages of a document. The following options are available:</p> <ul style="list-style-type: none"> • Pages in document -- Select which pages are customized: the First page or the Last page. • Paper source -- Specifies the source tray to use for printing a document. The list of source trays depends on the accessories that are installed. Any optional trays that are installed through the Device Settings tab also appear here. • Paper type -- Drop-down menu showing all of the paper types that the printer supports. <hr/> <p>NOTE: The same size of paper is used for the entire print job.</p> <hr/> <p>When you change the type and source of the paper and covers, the settings remain configured until you close the software program.</p>
<p>Print Quality</p>	<p>The selections for Print Quality may vary between printer models. See the user documentation for your printer for the supported print quality settings.</p> <hr/> <p>NOTE: Starting with UPD 6.4.1 and the HP LaserJet MFP E725xx, E825xx, E778xx and E876xx printers releasing in spring 2017, the print quality settings change to be more consistent across products. For more information, see Tables 7-3 and 7-4.</p>

NOTE: Gloss Level is not supported with Capabilities mode.

With the release of HP UPD 6.4.1, print quality settings have been updated for most products releasing in the first half of 2017 and later.

Table 7-3 HP UPD Print Quality Settings for New HP Laser-Based Products

HP Laser Print Quality Setting *	Description
Normal (default)	<ul style="list-style-type: none"> (Color) High quality printing for most documents with ImageREt (Mono) High quality printing for most documents with FastRes
Enhanced	<ul style="list-style-type: none"> (Color Only) Enhanced quality for photos, presentations and brochures
Fine Lines	<ul style="list-style-type: none"> (Color/Mono) 1200x1200 for line art, architectural drawings, finger prints
Quick View	<ul style="list-style-type: none"> (Color/Mono) Fast preview of documents, lower resolution
Economode	<ul style="list-style-type: none"> (Color/Mono) Lowest cost printing, lowest resolution

* New settings for products releasing the first half of 2017 and later. Specific settings may not be available on all products.

Table 7-4 HP UPD Print Quality Settings for HP Ink-Based Products

HP Ink Print Quality Setting *	Description (Color Printers)
Professional	<ul style="list-style-type: none"> High quality printing for most documents
Presentation	<ul style="list-style-type: none"> Enhanced quality for presentations and brochures
Maximum dpi	<ul style="list-style-type: none"> Slower print with premium quality intended for photo media
General Office	<ul style="list-style-type: none"> Fastest print speed at lower resolutions

* Specific settings may not be available on all products.

Add custom paper sizes

1. Click **Start** and then **Devices and Printers**
2. Right-click the print queue in the Printers folder.
3. Click **Printing preferences**.
4. Click the **Paper/Quality** tab.
5. Click **Custom** under **Paper Options**.

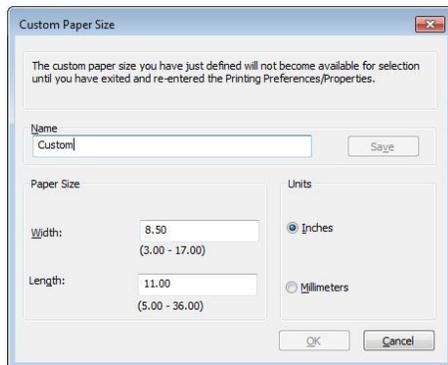


Figure 7-14 Custom Paper Size Dialog Box

6. Provide a name for the custom paper size and enter the dimensions in Inches or Millimeters.
7. Click **Save**.
8. Click **OK**.

To specify Special pages for the Covers or other pages

1. Click the **Settings** button under **Special Pages** on the **Paper/Quality** tab.
2. Select **Covers**.

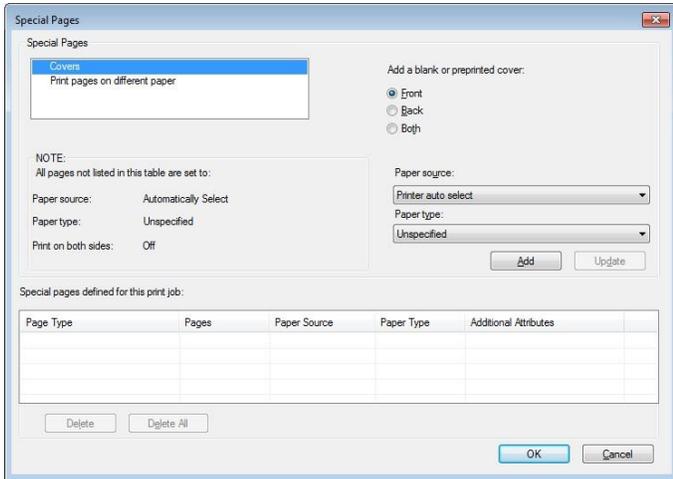


Figure 7-15 Special Pages Dialog for Covers

3. Specify where you want a blank or preprinted cover added (**Front**, **Back** or **Both**).
4. Select the **Paper source** and **Paper type**.
5. Click **Add**
6. Select **Print pages on different paper**.

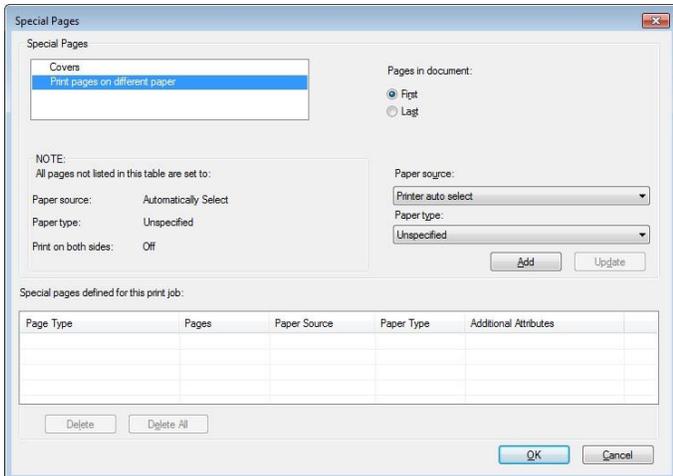


Figure 7-16 Print Pages on Different Paper

7. Select which pages in the document you want to print on different paper (**First** or **Last**).
8. Select the **Paper source** and **Paper type**.
9. Click **Add**.
10. Click **OK**.

Effects Tab Features

Use the **Effects** tab to create unique paper effects such as scaling and watermarks.

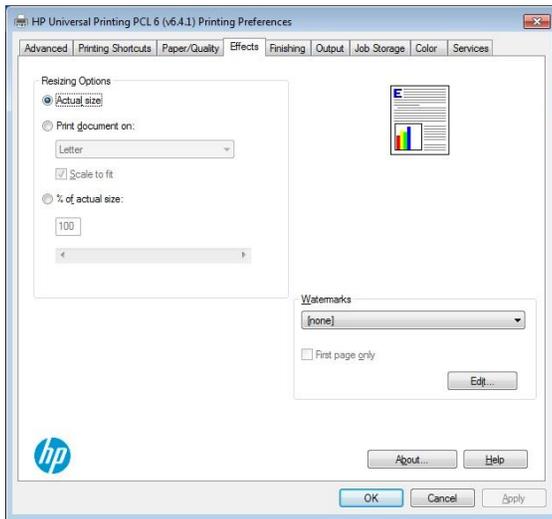


Figure 7-17 Effects Tab

Table 7-5 Effects Tab Features

Feature	Function
Resizing Options	<p>Actual size -- The default setting which prints the document without changing the document size.</p> <p>Print document on -- Click this option to format the document for one paper size and then print the document on a different paper size, with or without scaling the image to fit the new paper size.</p> <p>This option is disabled by either of the following conditions:</p> <ul style="list-style-type: none"> • The % of actual size value is not 100. • The Pages per sheet value (on the Finishing tab) is not 1. <p>When Print document on is selected, the drop-down menu shows the available paper sizes. The list contains all of the standard paper sizes that the selected paper source supports and any custom sizes that you have created.</p> <p>When Print document on is selected, Scale to fit is available. Clear this check box if you do not want your document reduced or enlarged to fit on the selected paper.</p> <p>Scale to fit -- Specifies whether each formatted document page image is scaled to fit the target paper size.</p> <p>Scale to fit is available when Print document on is selected. If the setting is unchecked, then the document page images will not be scaled, and are instead centered at full size on the target paper. If the document size is larger than the target paper size, then the document image is clipped. If it is smaller, then it is centered within the target paper. Figure 7-18 shows preview images for a document formatted for Legal-size paper with the Print document on check box selected, and the target size specified as Letter. The preview image uses a dashed gray line to show the boundaries of the logical page in relation to the target paper size.</p>

Feature	Function
	<p>% of actual size -- Provides a slider bar and input box to use for scaling the percentage setting. The default setting in the entry box is 100% of actual size. Actual size is defined as the paper size that is selected within the driver or what the driver receives from the software program (if the software program does not negotiate the paper size with the driver). The driver scales the page by the appropriate factor and sends it to the printer.</p> <p>The following settings disable % of actual size:</p> <ul style="list-style-type: none"> • Print document on (on the Effects tab) is selected • Pages per sheet (on the Finishing tab) is not 1 <p>The limits of the range are from 25% to 400%. Any values outside the range are adjusted to those limits as soon as another tab is selected or another control is selected.</p> <p>Any change to the scale also changes the page preview, which increases or decreases from the upper left corner of the preview.</p>
Watermarks	<p>Watermarks -- Use this feature to select a watermark, create a new watermark (text only), or edit an existing watermark.</p> <p>Watermarks are applied to logical pages. For example, when Pages per sheet is set to "4" and First page only is unchecked, four watermarks appear on the physical page (one on each logical page).</p> <p>The Watermarks feature can be configured using the Driver Configuration Utility in the HP PARK.</p> <p>Drop-down menu -- shows alphabetically sorted watermarks that are currently available on the system, plus the string "(none)," which indicates that no watermark is selected which is the default setting. Any watermark that is selected from this list appears in the preview image.</p> <p>If the [Username] watermark is selected, the driver will use the network username of the logged in user for the watermark.</p> <p>First page only -- When this check box is selected, the watermark is printed only on the first page of the document. The First page only check box is disabled when the current watermark selection is "(none)."</p> <p>Edit -- To view the Watermark Details for configuring custom watermarks.</p>
<p>Watermark Details</p> <p>Click Edit to access the Watermarks Details dialog box</p>	<p>Current Watermarks -- Lists the available watermarks, both predefined watermarks that are available in the driver and any new watermarks that you have created.</p> <p>Watermark Message -- The name that identifies the watermark in the Current Watermarks list, except when more than one watermark has the same message.</p> <p>For example, you might want several different watermarks with the message DRAFT, each with a different typeface or font size. When this occurs, the string is appended with a space, a pound sign, and a number (for example, Draft #2).</p> <p>When a number is added, the number two is used first, but if the resulting name is also in the list, then the number increases until the name is unique (Draft #3, Draft #4, and so on).</p> <p>Group Watermark -- Combine multiple dynamic watermarks together and position them to the Top Right or Center of the page.</p>

Feature	Function
	<p>Message Angle -- Use these controls to print the watermark in different orientations on the page. All settings center the watermark string within the page. The selection of a particular setting affects only the angle of the string placement. The following settings are available:</p> <ul style="list-style-type: none"> • Diagonal -- Places the text along a line that spans the lower-left to upper-right corners of the page. The default setting. • Horizontal -- Places the text along a line that spans the mid-left to mid-right edges of the page. • Angle -- Places the text at the specified angle across the page. Use the numeric spin box to select the angle. <p>Font Attributes: Name -- Specifies the font to use for the watermark. The dropdown lists the fonts that are currently installed on the system. The default is language-dependent.</p> <p>Font Attributes: Color -- Specifies the color to use for the watermark. The dropdown lists the colors available.</p> <p>Font Attributes: Shading -- The default Shading setting for new and preset watermarks is Very Light. The following range of shades is available from the Shading drop-down menu:</p> <ul style="list-style-type: none"> • Lightest • Very Light (default) • Light • Medium Light • Medium • Medium Dark • Dark • Very Dark • Darkest <p>These values represent the intensity of the color that is used. Select Light to produce a lightly saturated watermark. Select Lightest to produce the lightest shade of watermark. Select Darkest to produce a fully saturated watermark (black if gray is selected).</p> <p>Font Attributes: Size -- Specifies the font size to use for the watermark. 1 to 999 points are available. The default point size is language-dependent.</p> <p>Font Attributes: Style -- Specifies the style to use for the watermark. The following settings are available:</p> <ul style="list-style-type: none"> • Regular • Bold • Italic • Bold Italic <p>The default Style setting for new and preset watermarks is Regular.</p> <p>OK and Cancel buttons -- Click OK to accept all of the changes that are made in the Watermark Details dialog box.</p> <p>However, clicking Cancel does not cancel all of the changes. If you make changes to a watermark and then select a different watermark or click New, all of the changes are saved, and only the current, unsaved changes can be canceled.</p>

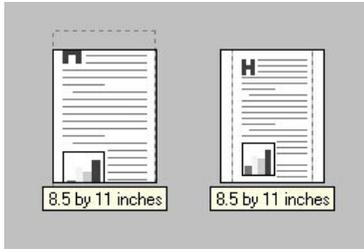


Figure 7-18 Preview Images: Legal on Letter; Scale to Fit Off (Left) and On (Right)



Figure 7-19 Watermark Details dialog box

To create a new watermark

- 1 Under **Watermarks** on the **Effects** tab of **Printing preferences**, click **Edit**.

NOTE: A maximum of 30 watermarks can be saved in the **Current Watermarks** list at one time. When you reach the limit of 30 watermarks, the **New** button is disabled.

- 2 To create a new watermark, click **New**.

The new watermark appears in the **Current Watermarks** list and in the **Watermark Message** edit box as **"Untitled"**.

- To edit an existing watermark, select the watermark in the **Current Watermarks** list.

If you change the **Watermark Message** for that watermark, you are, in effect, creating a new watermark.

- To delete a watermark, select the watermark in the **Current Watermarks** list, and then click **Delete**.

A warning appears asking whether you are sure you want to delete the selected item. Click **Cancel** if you want to keep the watermark. Click **OK** to delete the selected watermark.

- 3 Type the name for the watermark in the **Watermark Message** field.

The name that you type in the **Watermark Message** field appears in the **Current Watermarks** group box in the **Watermark Details** dialog box and in the **Watermarks** group box on the **Effects** tab.

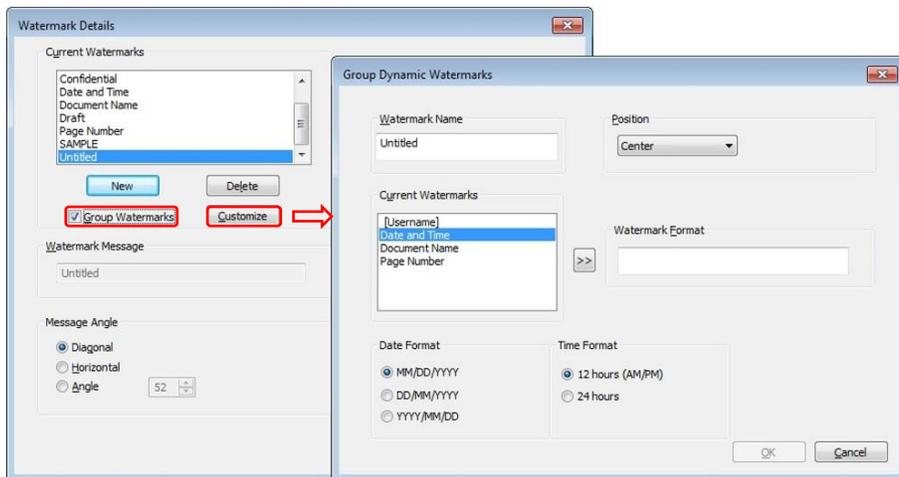


Figure 7-20 Group Dynamic Watermarks dialog box

4 If you want to create a group watermark, perform the following steps:

- a. Select the **Group Watermarks** check box.
- b. Click **Customize**
- c. If you want Date and Time in the group watermark, select **Date and Time**, select the **Date Format** and **Time Format** and click the “>>” button.

NOTE: The order in which you select the watermarks you want grouped is the order they will be displayed. For example, if you want Document Name first and then Date and Time, select **Document Name** and click the “>>” button prior to selecting **Date and Time**.

- d. Select each of the other watermarks you want grouped and click the “>>” button.
- e. Select the drop menu for **Position** and click **Center** or **Top Right**.
- f. Click **OK**

5 Under **Message Angle**, select how you want the watermark positioned on the page.

- **Diagonal** -- Places the text along a line that spans the lower-left to upper-right corners of the page.
- **Horizontal** -- Places the text along a line that spans the mid-left to mid-right edges of the page.
- **Angle** -- Places the text at the specified angle across the page. Use the numeric spin box to select the angle.

NOTE: Message Angle is not available for Group Watermarks positioned to the Top Right.

6 Select the name of the font you want to use.

7 Select the font color.

8 Select the level of shading for the new watermark.

9 Select the font size.

10 Select the style for the characters for the watermark, **Regular**, **Bold**, **Italic** or **Bold Italic**

11 Click **OK** to accept all of the changes.

NOTE: Clicking **Cancel** does not cancel all of the changes. If you make changes to a watermark and then select a different watermark or click **New**, all of the changes are saved, and only the current, unsaved changes can be canceled.

Default watermark settings

The following table shows the default **Font Attribute** settings for new and preset watermarks.

Table 7-6 Font Attribute Settings for New and Preset Watermarks

Setting	New watermark	Preset watermark
Name	Arial	Varies by language
Color	Gray	Gray
Shading	Very Light	Very Light
Size	80	Varies by language
Style	Regular	Bold

Finishing Tab Features

Use the **Finishing** tab to print booklets and control paper output.

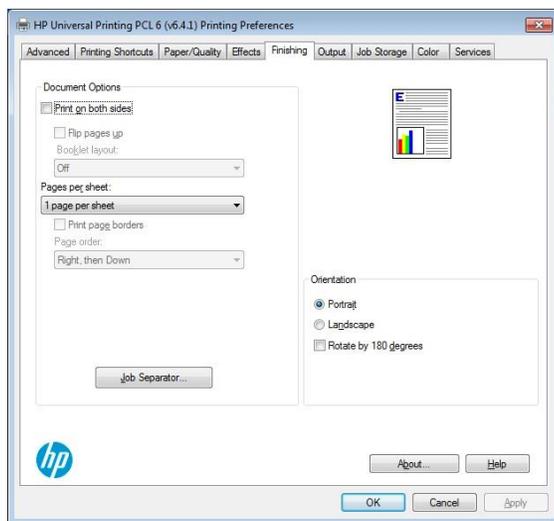


Figure 7-21 Finishing Tab

Table 7-7 Finishing Tab Features

Feature	Function
Document Options	<p>Print on both sides – Enables printing on two sides of a sheet of paper. The default is off (not selected). Print on both sides is available when the following conditions exist:</p> <ul style="list-style-type: none"> • Paper type on the Paper/Quality tab is set to any paper type except for the following types: <ul style="list-style-type: none"> ○ Labels ○ Monochrome Laser Transparency ○ Envelopes • Paper sizes is set to any paper size except for the following sizes: <ul style="list-style-type: none"> ○ Statement ○ 3x5 ○ 4x6 ○ 5x7 ○ 5x8 ○ A6 ○ B6 ○ 10x15cm

Feature	Function
	<ul style="list-style-type: none"> ○ Envelope #10 ○ Japanese Postcard ○ Envelope #9 ○ Envelope Monarch ○ Envelope B5 ○ Envelope C5 ○ Envelope C6 ○ Envelope DL <p>Most printer models that support Print on both sides (duplexing) support smart duplexing. This increases printing performance by preventing one-page print jobs or single-sided pages of a duplexed print job from going through the duplexing unit even when the duplexing feature has been selected in the driver. Smart duplexing is not supported on paper types that cannot be printed on both sides (such as labels, transparencies, envelopes, pre-punched, preprinted, letterhead or cardstock).</p> <p>When the paper type is set to Unspecified, the smart duplexing feature is disabled.</p>
	<p>Flip pages up -- Specifies the duplex-binding option. By default, the Flip pages up check box is not available. It is available only when Print on both sides is selected.</p> <p>Table 7-8 shows how orientation impacts this setting.</p> <p>With Portrait selected, short-side binding is for print jobs with pages that read by flipping over like the pages of a calendar.</p> <p>With Portrait selected, long-side binding is for print jobs with pages that read by turning like the pages of a book.</p>
	<p>Booklet layout drop-down menu – Available when Print on both sides is selected, provides options based on the current paper size. The default is Off.</p> <p>Selecting Left binding or Right binding automatically changes to pages per sheet to 2 pages per sheet.</p> <p>Changing the Pages per sheet setting manually to 4, 6, 9, or 16 pages per sheet disables the booklet setting.</p>
	<p>Pages per sheet -- Selects the number of pages that you want to print on a single sheet of paper. If you choose to print more than one page per sheet, the pages appear smaller and are arranged on the sheet in the order that they would otherwise be printed. The Pages per sheet dropdown menu provides six settings:</p> <ul style="list-style-type: none"> • 1 page per sheet (the default) • 2 pages per sheet • 4 pages per sheet • 6 pages per sheet • 9 pages per sheet • 16 pages per sheet <hr/> <p>NOTE: When you select an option other than 2 pages per sheet, booklet printing is not available.</p> <hr/> <p>Related controls indented beneath Pages per sheet are Print page borders and Page order, which become active when Pages per sheet is greater than 1.</p> <p>Figures 7-22 and 7-23 shows preview images of how Page order impacts Pages per sheet.</p>

Feature	Function
	<p>Print page borders – Places a line around each page image on a printed sheet to help visually define the borders of each logical page.</p> <p>Page order drop-down menu – Selects the order and placement of pages on a sheet when you print more than one page per sheet. The following selections are available:</p> <ul style="list-style-type: none"> • Right, then Down • Down, then Right • Left, then Down • Down, then Left <p>Figures 7-22 and 7-23 shows preview images of how Page order impacts Pages per sheet.</p>
<p>Job Separator</p> <hr/> <p>NOTE: Job Separator must be enabled in the Device Settings tab in Printer properties to use this feature.</p>	<p>Job Separator Mode – Inserts a separator page (a divider page) at the start of the print job and between any print jobs.</p> <ul style="list-style-type: none"> • Off • Separator page – Prints a separator page for each job. For multiple print jobs, each job will print a separator page. • Separator Page (Alternate) – Prints one separator page for the entire job. For multiple copy print jobs, only the first job prints a separator page. <ul style="list-style-type: none"> ○ Paper Source and Paper Type will use the same paper source and type for all printed pages including the separator pages. ○ If Job Storage is enabled, the print job will be stored and the separator page will be printed without the job. <p>User Name – Prints a Windows user name on the separator page.</p> <p>File name -- Print the file name on the separator page.</p> <p>Application name -- Prints the application name on the separator page.</p> <p>Date and time -- Prints the date and time of the print job on the separator page.</p> <p>Source is: -- Specifies the paper source tray to use for printing the separator page.</p> <p>Type is: -- Specifies the paper type to use for printing the separator page.</p> <hr/> <p>NOTE: Source and Type is not available in the Separator Page (Alternate) mode.</p>
<p>Orientation</p>	<p>Orientation -- Refers to the layout of the image on the page, and does not affect the way that paper feeds into the printer.</p> <p>You can toggle orientation between Portrait and Landscape by clicking the document preview image.</p> <hr/> <p>NOTE: Nearly all software programs establish the orientation for the printed page. The page orientation in the driver is useful only for the few software programs that do not set an orientation.</p> <hr/> <p>Portrait -- The top edge of the document is the shorter edge of the paper (the default orientation).</p> <p>Landscape -- The top edge of the document is the longer edge of the paper.</p> <p>Rotate by 180 degrees -- This creates a landscape or portrait orientation in which the image is rotated 180°. This setting is useful for printing pre-punched paper.</p> <p>If you select the Rotate by 180 degrees check box, no change occurs in the document preview image.</p>

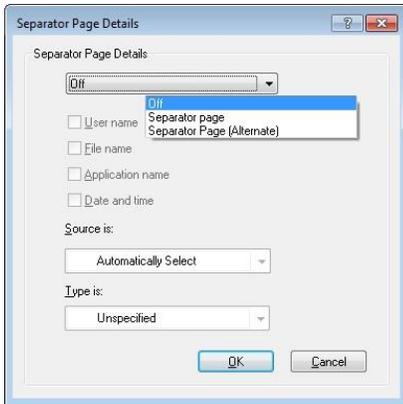


Figure 7-22 Job Separator dialog box

NOTE: Job Separator must be enabled in the Device Settings tab in Printer properties to use this feature.

Table 7-8 Page Orientation

Orientation (Finishing tab)	Flip Pages Up selected	Flip Pages Up not selected
Portrait	Short-edge binding	Long-edge binding
Landscape	Long-edge binding	Short-edge binding

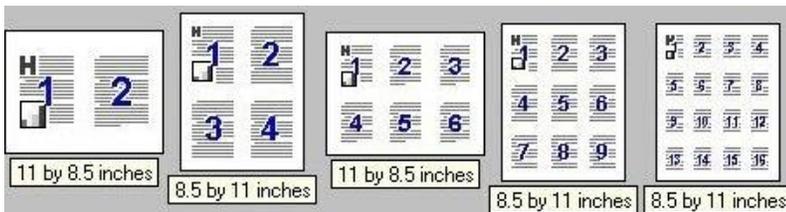


Figure 7-23 Pages per Sheet Preview Images

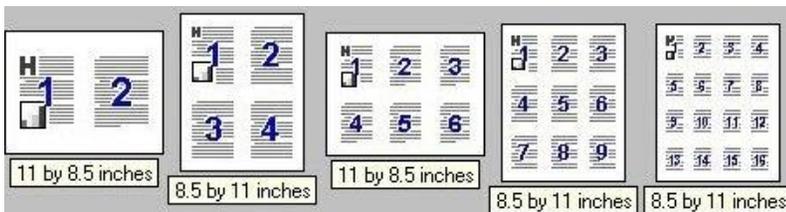


Figure 7-24 Pages per Sheet Preview Images with Right, then Down Page Order

Book and Booklet Printing

A book is a print job consisting of at least two pages. It can have a different paper type for the front cover, first page, other pages, last page, or back cover. Use the **Covers** and **Print pages on different paper** settings on the **Paper/Quality** tab to select different paper for the front cover, first page, other pages, and back cover.

A booklet is a print job that places two pages on each side of a sheet that can then be folded into a booklet that is half the size of the paper. Use the **Booklet layout** drop-down menu on the **Finishing** tab to control booklet settings.

Configuring Booklet Printing

The following shows general steps for how to configure the HP UPD for booklet making. In reality, settings in the application generally overwrite settings in the print driver which may overwrite settings in the printing device depending on the supported features of the physical printing device and output and finishing devices.

NOTE: In some cases, there is an interaction between the applications and print driver that may result in incorrect output. For example, when printing a booklet in Publisher 2003, before selecting File, Print, it is recommended to select File, Page Setup, Full page instead of Booklet, and click OK. This forces the Booklet mode off in Publisher 2003 while keeping the booklet format. If this is not set, the pages may print out of order because both the application and the driver are reordering the pages.

In the following example, we are printing a 20 page PDF document. The original document is letter size portrait. We are printing the document as a booklet on 11x17 media. These steps assume the printer has a duplex unit and supports the Fold and Stitch output option.

1. In the application, select **File** and then **Print**
2. Select the printer you want to use
3. Click **Properties**
4. Click the **Printing Shortcuts** tab
5. Click **Factory Defaults** and then click **Apply** to set the print driver to a known state
6. Click the **Paper/Quality** tab and select the paper size for each printed page (Letter in this example)
7. Click the **Finishing** tab, select **Print on both sides**, **Left Binding**, **2 pages per sheet**, and **Portrait**
8. Click the **Effects** tab, select **Print document on:** and select **11 x17** in the drop down box
9. Click the **Output** tab and under the **Staple** options, select **Fold and Stitch**
10. Click **OK** and then click **Print**

Output Tab Features

Use the **Output** tab to specify the output bin in which you want to send the print job.

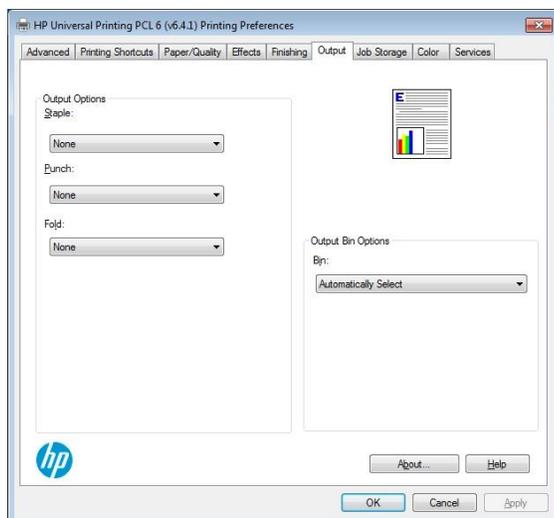


Figure 7-25 Output Tab

Output Options

Depending on the printer model and accessories, the **Output Options** group contains the following options:

- **Staple.**
- **Punch**
- **Fold**

NOTE: Depending on the printer and output accessories, two new fold options have been added: V-fold and C-fold.

For V-fold (Bi-fold), the sheet is folded into two equal sections with a single fold, creating four separate panels or pages to be printed on. Often used for bulletins, menus, programs, greeting cards, technical instructions, booklet pages

C-fold (Tri-fold) uses two folds with the sheet folded into three nearly equal sections, with one panel serving as a cover, creating six panels for printed content. Often used for self-mailing brochures or pamphlets, letters, statements, invoices, bulletins, any letter size sheet (8.5" x 11") requiring insertion into a standard #10 or #9 envelope.

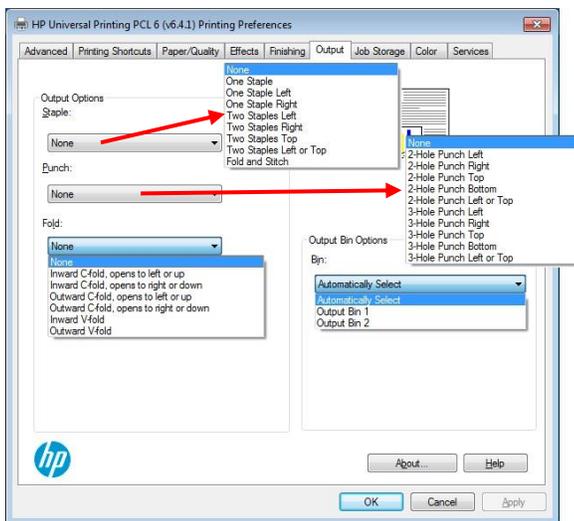


Figure 7-26 HP UPD Available Output Device Settings with Capabilities mode

NOTE: Available settings will vary depending on the printer and optional output device

Output Bin Options

The **Output Bin Options** are dependent on the printer model and accessories as well as the current mode setting for the output device, such as Mailbox or Stacker mode.

For more information, see the user documentation for your printer.

NOTE: With Capabilities mode, the Booklet Maker bin is no longer listed under Output Bin Options. Select Fold and Stitch under the Staple options to select the Booklet Maker.

Job Storage Tab Features

Job Storage provides the capability of a printer to store a print job on the target product's hard drive or in its memory. This feature allows a print job to be stored and printed at the user's convenience. Job storage also provides features for making a print job a personal or stored job with a personal identification number (PIN) as well as the ability to proof a print job.

The **Job Storage** tab appears among the driver tabs only if the **Job Storage** feature is enabled on the **Device Settings** tab of **Printer Properties**.

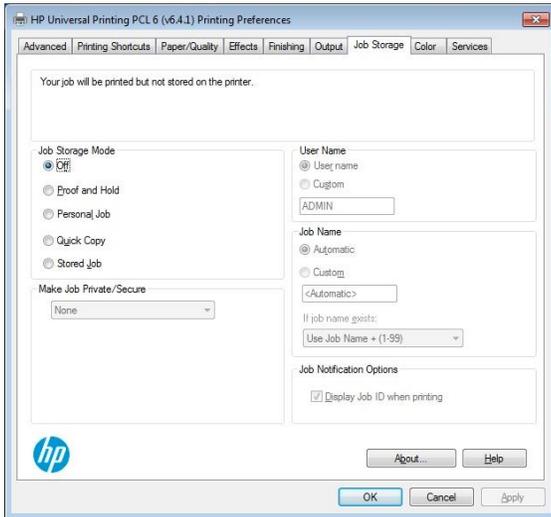


Figure 7-27 Job Storage Tab

Table 7-9 Job Storage tab features

Feature	Function
Status group box	The unlabeled group box at the top of the Job Storage tab contains a status message about the destination of a print job. The status information changes depending on the selections that are made on the Job Storage tab.
Job Storage Mode	Off -- Turns the Job Storage feature off. The print job will not be stored in the printer.
	Proof and Hold – Allows users to print the first page of a multi-page print job and verify their print displays as designed. After the first page is proofed, users print the remaining pages at the printer control panel. After it is released for printing, the proof-and-hold job is immediately deleted from the product.
	Personal Job – A user's print job is stored on the printer, but not printed until the print job is printed at the control panel. After the job is printed, it is automatically removed from the printer's job storage. Personal jobs can be secured with a PIN or encrypted.
	Quick Copy – Allows users to print a job through the print driver and store the print job on the printer's hard drive for printing at a later time, without the need to re-access the print job at their PC.

Feature	Function
	<p>Stored Job – Allows users to send a print job to a printer's hard drive or RAM disk and store the print job. The stored job can be printed at any time from the printer's control panel, eliminating the need to send commonly printed jobs or forms from a user PC each time they are printed.</p> <p>Stored jobs can be secured with a PIN or encrypted.</p>
User Name	Defines how a job is stored and identified on the printer. By default, a job is stored under a user name. Selecting the Custom option allows a user to create a new identifier for stored jobs.
Make Job Private/Secured	<p>Personal jobs and Stored jobs can be made private by selecting PIN to print and entering a 4-digit PIN. The PIN must be entered at the control panel to print the personal or stored job. This setting can be pre-configured using INSTALL.EXE, AD group policy, HP DCU, or HP DDU.</p> <hr/> <p>NOTE: If a print job is made private and no PIN is entered, the PIN defaults to "0000".</p> <hr/> <p>For HP FutureSmart devices that provide print job storage functionality, HP UPD v5.3 introduced the Secure Encrypted Print feature (Encrypt job). Users can encrypt their print job with a print job password for either personal jobs or stored jobs on the printer.</p>
Job Name	Allows a user to identify the stored job by a custom name. The default settings are increased in numerical value as they are stored on the printers.
If job name exists:	Allows the user to make a decision regarding same name print jobs that are being stored on the printer.
Job Notification Options	Allows the user to decide if the job storage message and job name are displayed on the user's screen when the job is sent to the printer.

How the HP UPD works with job storage

During installation, the HP UPD queries the products for installed options and additional equipment using Printer Automatic Configuration. When job storage capabilities are detected, the HP UPD enables the job storage feature and mopier features. To override these settings, set **Mopier mode** to **Disabled** in **Device Settings of Printer Properties**. This disables job storage as well as product based collation. Because printer drivers do not perform capacity checks before attempting to store print jobs, the job storage area might become full. If this occurs, an **Unable to store job at printer** error message will display.

NOTE: If the HP UPD detects the presence of a hard drive or RAM disk on a printer, the **Job Storage** tab is displayed and job storage is enabled by default.

If a RAM disk is used, jobs stored on this product are lost when the product is turned off and then turned back on.

To use HP Secure Encrypted Print

HP Secure Encrypted Print (SEP) is the perfect solution for printing sensitive documents. The HP UPD provides true symmetric AES256 print-job encryption and decryption from the client to the page based on a user-defined password using a FIPS-140-validated cryptographic module from Microsoft®. Both the key and the job are stored in the encrypted format on the printer with HP FutureSmart firmware until they are released by the user.

NOTE: For more details, see csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2007.htm#825.

For HP FutureSmart devices that provide print-job storage functionality, HP UPD v5.3 introduced the Secure Encrypted Print feature. It is available from the **Job Storage** tab of the default installation of the HP UPD. Users can encrypt their print job and print-job password for either personal jobs or stored jobs on the printer. With HP UPD v5.4 and later versions, IT departments can configure the driver to require either a PIN or HP SEP (HP Secure Encrypted

Print) password on every job. This balances the need for security in certain departments with the user-print experience.

Setup and configuration

Follow these steps to configure the HP UPD for secure print:

1. Install the HP UPD in either traditional or dynamic mode.
2. Point the HP UPD port to an HP FutureSmart printer with available job storage functionality.

The printer must be running HP FutureSmart v11.2 or higher. Follow these steps to determine if the HP FutureSmart firmware on your product is v11.2 or higher:

- a. From the **Home** screen on the product control panel, scroll to and touch the **Administration** button.

NOTE: On printers releasing the first half of 2017 and later, scroll to the left to view the **Reports** icon

- b. Open the following menus:
 - **Reports**
 - **Configuration/Status Pages**
 - **Configuration Page**
- c. Touch the **View** button to view the information on the control panel, or touch the **Print** button to print the pages.
- d. Locate the firmware Date Code in the Device Information section of the configuration page. Date Codes are displayed in a YYYYMMDD format.
- e. Compare the Date Code to the following table:

Table 7-10 Date Codes

HP FutureSmart version	Product	Datecode
v11.2	HP CLJ Enterprise CP5525	20110630
	HP CLJ Enterprise CM4540 MFP	20110604
	HP LJ M4555 MFP	20110604
v11.3 or later	All products	20111217 or later

The HP UPD will detect the capabilities of the target print product and display the Secure Encrypted Print options in the HP UPD interface.

The HP UPD interface will only display the **Encrypt Job (with password)** option when the target product is an HP FutureSmart printer with firmware v11.2 or higher. Printers that do not support encrypted print will only display the **Make Job Private** option. The **Encrypt Job (with password)** option is only available for **Personal** and **Stored Jobs**. Personal jobs are deleted from the printer storage drive after the user provides their password. Stored jobs remain on the printer storage drive, allowing repeat retrieval of the job with the print password.

To use Job Storage features when printing

To use **Job Storage** features when printing, follow these steps:

1. Click **File**, and then click **Print** from the software program. The **Print** dialog box appears.

NOTE: Clicking the print icon in the software program toolbar prints the job without using job storage features.

2. Click **Properties** or **Preferences**. The Printing Preferences tabs appear.

NOTE: The label for the button that opens the **Printer Preferences** dialog box varies between software programs. For example, in Adobe Acrobat on Windows 7 the button is labeled **Properties**. In Internet Explorer 11 the button is labeled **Preferences**.

3. Click the **Job Storage** tab.
4. Select the **Job Storage** options by clicking the appropriate option button, and then complete any required fields.
5. If you want to make the job private or secure and you selected **Personal Job** or **Stored Job**, select the drop down field for **Make Private/Secure**

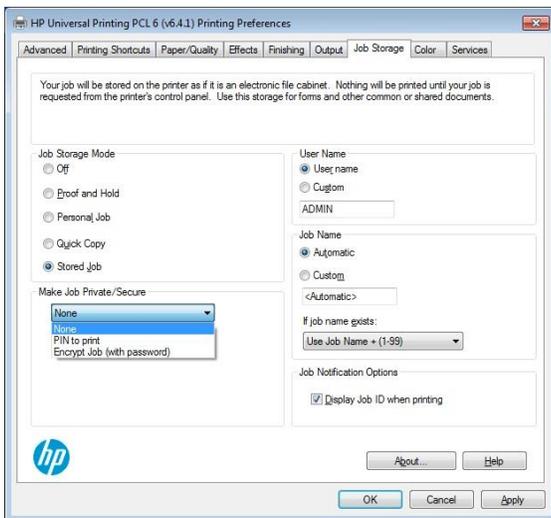


Figure 7-28 Job Storage tab showing the Make Job Private/Secure options

6. If you selected **PIN to print**, enter a four-digit numeric password
7. Click **OK** and then click **Print**.



Figure 7-29 Encrypt Job dialog for entering and confirming the password

8. If you selected **Encrypt Job (with password)** from your application, a dialog appears. Enter and confirm your password and then select **OK**.

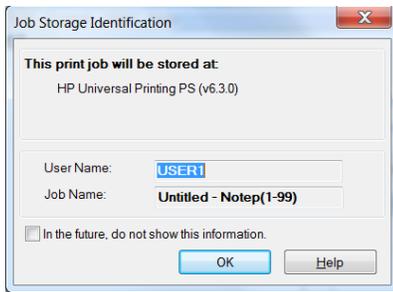


Figure 7-30 Job Storage Identification dialog

9. If a Job Storage Identification dialog appears, select **OK**.

Release a job-storage print job

After you send a print job that uses the job-storage feature, you can release the job to print from the printer front panel.

NOTE: These steps may vary slightly depending on the specific product you are using.

1. Select **Retrieve from Device Memory** on the **Home** page of the printer front panel

NOTE: On printers releasing the first half of 2017 and later, select **Print** on the **Home** page of the printer front panel, select **Print from Job Storage**, and then select **Choose**.

2. Select the folder to display the current files
3. Select the file you want to print
4. If the file is password protected, a dialog for entering the password is displayed. Enter the password or PIN for the file and select **OK**.

NOTE: On printers releasing the first half of 2017 and later, select the **Select** button, a dialog for entering the password is displayed. Enter the password or PIN for the file and select **OK**.

5. Select the number of copies
6. Select **Retrieve from Device Memory** to print the file.

NOTE: On printers releasing the first half of 2017 and later, select **Print**.

7. If the Status dialog is displayed, select **OK**.

Delete a job-storage print job

Sometimes it is necessary to delete a print job from the printer hard disk. You can do this from the printer front panel.

NOTE: These steps may vary slightly depending on the specific product you are using.

1. Select **Retrieve from Device Memory** on the **Home** page of the printer front panel

NOTE: On printers releasing the first half of 2017 and later, select **Print** on the **Home** page of the printer front panel, select **Print from Job Storage**, and then select **Choose**.

2. Select the folder to display the current files
3. Select the file you want to delete

- If the file is password protected, a dialog for entering the password is displayed. Enter the password or PIN for the file and select OK.

NOTE: On printers releasing the first half of 2017 and later, select the Select button, a dialog for entering the password is displayed. Enter the password or PIN for the file and select **OK**.

- Select **Delete** and select **OK**

NOTE: On printers releasing the first half of 2017 and later, select the trash can icon in the lower left corner and select **Delete Jobs**.

Pre-configure job storage capabilities

The job storage feature can be pre-configured and, if desired, locked during printing. For security purposes, a company might decide to force every print job to be stored on the printer and retrieved by a user, so no documents reside on the output tray unattended. The following section describes the different methods for pre-configuring the job storage feature.

Table 7-11 Pre-configuration methods

Pre-configuration method	Notes
HP Driver Configuration Utility (DCU)	<p>Job storage (Job Storage Mode), can be enabled and locked prior to driver deployment. Use the pull down menu to select the proper method of job storage desired. Put a check mark in the Lock section if you want to force the Job storage mode.</p> <p>If Personal Job or Stored Job is selected, an additional pull down menu is created to allow for the setting of custom PIN numbers. Make a selection from this menu to encrypt the job. See the HP DCU release notes for additional information.</p> <hr/> <p>NOTE: HP DCU is available for traditional mode installations only.</p> <hr/>
HP Driver Deployment Utility (DDU)	<p>Utilizes the HP DCU to allow an administrator to pre-configure the driver settings prior to creating the driver package. See the Readme notes accompanying the HP DDU tool for additional details.</p> <hr/> <p>NOTE: The HP DDU is available for traditional mode installations only.</p> <hr/>
HP UPD Active Directory Administrator Template	<p>The Default Print Settings section is used to enable and configure the job storage feature. Enable the feature and choose the job storage option. See Managing the HP UPD with Active Directory Group Policy (chapter 8) for more details.</p> <hr/> <p>NOTE: The HP UPD Active Directory Administrator Template is available for both dynamic and traditional mode installations.</p> <hr/>

Color Tab Features

Use the **Color** tab to specify predefined color-option settings or to fine-tune the color. Color output can also be converted to grayscale.

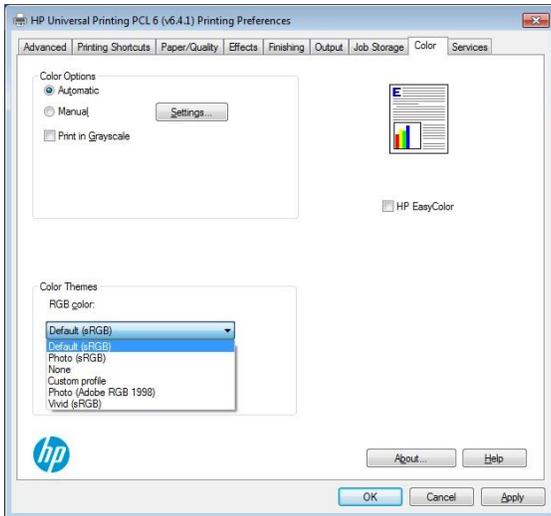


Figure 7-31 PCL 6 (Laser) Color Tab with RGB color dropdown menu

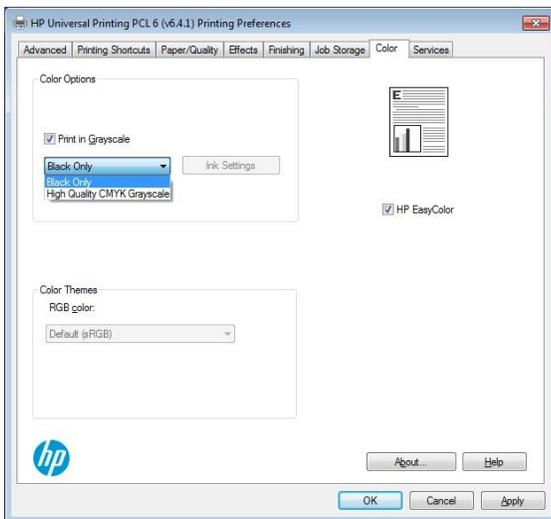


Figure 7-32 PCL 6 (Ink) Color Tab with Print in Grayscale and HP Easy Color selected

NOTE: Selecting **Print in Grayscale** and **Black Only** prints the document as a Monochrome (Black Only) document.

Table 7-12 Color Tab Features

Feature	Function
Color Options	<p>Print in Grayscale – Select this option to configure the HP UPD to print in black and white on color devices.</p> <p>When Print in Grayscale is selected for HP Ink-based printers, a dropdown menu is displayed to select Black Only or High Quality CMYK Grayscale printing.</p> <hr/> <p>NOTE: HP UPD 6.4.1 decoupled the dropdown to select Black Only or High Quality CMYK Grayscale and HP EasyColor so that the dropdown settings can be selected when Print in Grayscale and HP EasyColor is selected. Black Ink Only was changed to Black Only and High Quality was changed to High Quality CMYK Grayscale. This dropdown has also been added to most HP LaserJet printers introducing in the first half of 2017 and later.</p> <hr/> <p>This option can be manually specified and can also be preconfigured using the HP Driver Configuration Utility (HP DCU) in the HP Printer Administrators Resource Kit (HP PARK) (See Pre-configure the HP UPD default settings using HP Driver Configuration Utility in chapter 4.)</p> <hr/> <p>NOTE: HP UPD 6.3.0 decoupled Print in Grayscale and HP EasyColor for so that Print in Grayscale can be selected when HP EasyColor is selected.</p> <hr/> <p>Automatic/Manual -- Use the Manual color adjustment option to adjust the neutral-gray color treatment, halftones, and edge enhancements for text, graphics, and photographs.</p> <p>HP LaserJet Settings – These settings are available on HP LaserJet printers when HP EasyColor is not selected.</p> <p>Edge Control determines how edges are rendered. Edge control has three components: adaptive halftoning, Resolution Enhancement Technology (REt), and trapping. Adaptive halftoning increases the edge sharpness. Trapping reduces the effect of incorrect color alignment by slightly overlapping the edges of adjacent objects. The color REt option smooths the edges.</p> <hr/> <p>NOTE: If you notice white gaps between objects, or if you notice areas that have a slight shadow of cyan, magenta, or yellow at the edge, choose an edge-control setting that increases the trapping level.</p> <hr/> <p>Four levels of edge control are available:</p> <ul style="list-style-type: none"> • Off turns off trapping, adaptive halftoning, and color REt. • Light sets trapping at a minimal level. Adaptive halftoning and color REt settings are on. • Normal is the default trapping setting. Trapping is at a medium level. Adaptive halftoning and color REt settings are on. • Maximum is the most aggressive trapping setting. Adaptive halftoning and color REt settings are on. <p>Halftone options affect the resolution and clarity of your color output. You can select halftone settings independently for text, graphics, and photographs. The two halftone options are Smooth and Detail.</p> <ul style="list-style-type: none"> • The Smooth option provides better results for large, solid-filled print areas. It also enhances photographs by smoothing out fine color gradations. Select this option when uniform and smooth area fills are the top priority. • The Detail option is useful for text and graphics that require sharp distinctions among lines or colors, or for images that contain a pattern or a

Feature	Function
	<p>high level of detail. Select this option when sharp edges and details are the top priority.</p> <p>Neutral Grays determines the method for creating gray colors used in text, graphics, and photographs.</p> <ul style="list-style-type: none"> • Black Only generates neutral colors (grays and black) by using only black toner. This guarantees neutral colors without a color cast. This setting is best for documents and grayscale viewgraphs. • 4-Color generates neutral colors (grays and black) by combining all four toner colors. This method produces smoother gradients and transitions to other colors, and it produces the darkest black. <hr/> <p>NOTE: Some software programs convert text or graphics to raster images. In these cases, the Photographs settings also control text and graphics.</p> <hr/> <p>Ink Settings – These settings are available on HP ink-based printers when HP EasyColor is not selected.</p> <p>Selecting Ink Settings displays a dialog for setting the Dry Time, Saturation and Black Ink Spread.</p> <p>Increasing Dry Time will slow down throughput but may reduce ink smearing. Decreasing Saturation may make prints look faded. Increasing Saturation may make plots look more vibrant. Decreasing Black Ink Spread will improve areas where black and color are adjacent if the black is spreading into the colors.</p>
<p>Color Themes – RGB Color</p> <p>To change Color Themes when using PCL6, first de-select the HP EasyColor option.</p> <hr/> <p>NOTE: These settings may vary depending on the features of specific printers. See the user documentation for your printer for more information.</p>	<p>Default (sRGB) -- Instructs the product to interpret RGB color as sRGB, which is the accepted standard of Microsoft and the World Wide Web Consortium (W3C). Colors are matched to optimize the RGB colors on the screen and to provide vivid images and graphics.</p> <hr/> <p>Photo (sRGB) -- Enhances documents in which the content is mainly bitmap images, such as .GIF or .eps files. This setting instructs the product to use the best color matching for rendering sRGB bitmap images.</p> <p>This setting only affects raster data. It has no effect on text or vector-based graphics.</p> <p>Using glossy paper in combination with this setting provides the maximum enhancement.</p> <hr/> <p>Photo (AdobeRGB 1998) -- For documents that use the AdobeRGB color space rather than sRGB.</p> <p>For example, some digital cameras capture images in Adobe RGB, and documents that are produced with Adobe PhotoShop use the Adobe RGB color space.</p> <p>When printing from a professional software program that uses Adobe RGB, it is important that you turn off the color management in the software program and allow the product software to manage the color space.</p> <hr/> <p>Vivid (sRGB) -- instructs the printer to increase the color saturation in the midtones. Less colorful objects are rendered more colorfully.</p> <p>This is recommended for printing business graphics.</p> <hr/> <p>None -- Instructs the printer to print RGB data in raw device mode.</p> <p>To render documents properly when this option is selected, you must manage color in the program in which you are working or in the operating system.</p>

Feature	Function
	<p>CAUTION: Use this option only if you are familiar with the procedures for managing color in the software program or in the operating system.</p> <p>Custom Profile – Instructs the product to use a custom profile to emulate color output from another product by modifying how color is rendered.</p> <p>You can download custom profiles from the following Web site: www.hp.com</p>
Color Themes – CMYK Color (PS Only)	<p>By default, the printer interprets CMYK data according to the Standard Web Offset Press (SWOP) standard. This standard defines how a particular set of CMYK ink colors should behave. The printer performs a SWOP color map and internal halftones to emulate a SWOP CMYK press.</p> <p>Emulation for Dainippon Press (DIC) and Euro-standard CMYK inks used in the Far East and Europe are also available and can be selected from the printer driver.</p>
HP EasyColor	<p>Automatically improves mixed-content documents that are printed from Microsoft Office programs. This technology scans documents and automatically adjusts photographic images in .JPEG or .PNG format.</p> <p>HP EasyColor technology enhances the entire image at one time, rather than dividing it into several pieces. This results in improved color consistency, sharper details, and faster printing.</p> <p>In figure 7-30, the images on the left were created without using the HP EasyColor option. The images on the right show the enhancements that result from using the HP EasyColor option.</p> <p>The HP EasyColor option is enabled by default in the HP PCL 6 print driver, so you do not need to make manual color adjustments. To disable the option so you can manually adjust the color settings, open the Color tab and click the HP EasyColor check box to clear it.</p> <hr/> <p>NOTE: HP UPD 6.3.0 decoupled Print in Grayscale and HP EasyColor so that Print in Grayscale can be selected when HP EasyColor is selected.</p>



Figure 7-33 HP EasyColor Examples (HP EasyColor Enabled on the right)

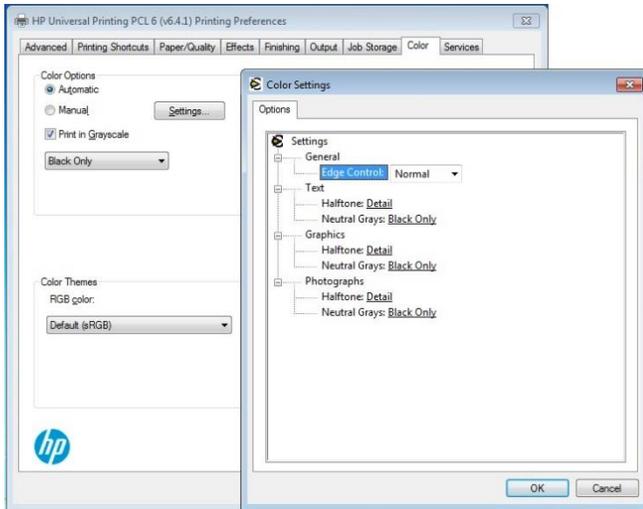


Figure 7-34 Color Settings for HP Laser Printers

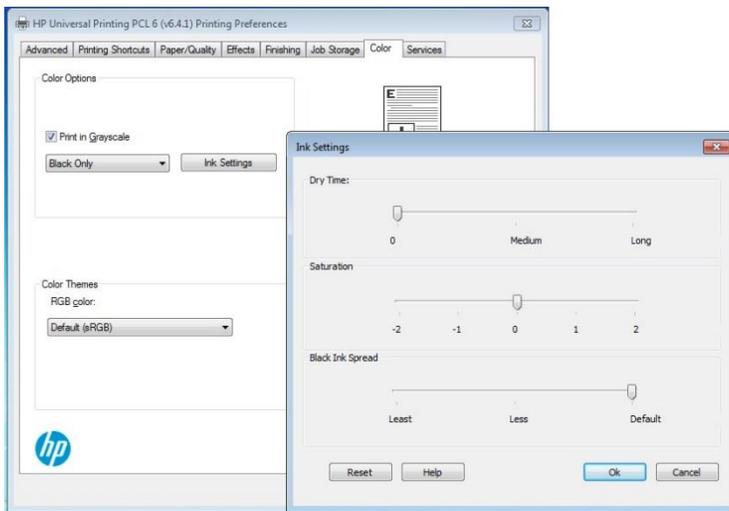


Figure 7-35 Ink Settings for HP ink-based printers

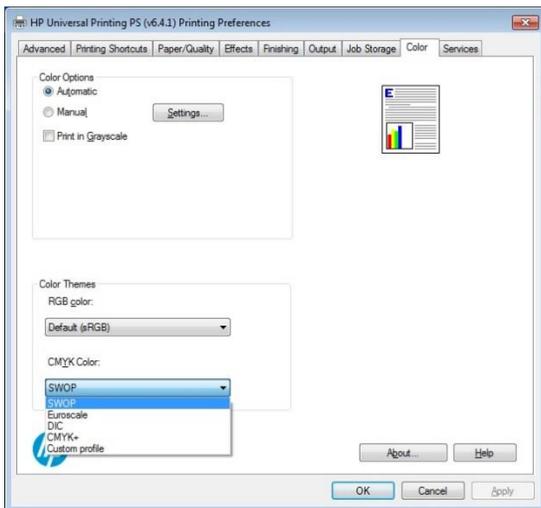


Figure 7-36 PS CMYK Color dropdown menu

Services Tab Features

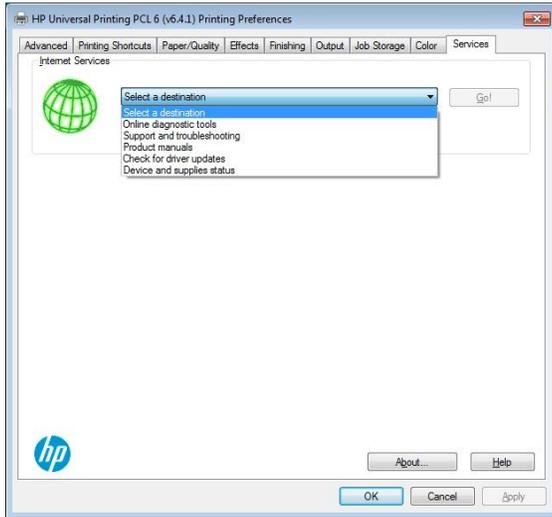


Figure 7-37 Services Tab

Internet Services

The **Internet Services** group box on the **Services** tab contains the **Select a destination** drop-down menu with the following selections:

- **Online diagnostic tools** -- This is the HP Instant Support Web site, where you can find interactive tools and contacts for troubleshooting.
- **Support and troubleshooting** -- This is the main Web site for printer support.
- **Product manuals** -- View or download printer manuals.
- **Check for driver updates** -- Automatically check your print drivers to see whether the correct and most up-to-date print drivers are installed.
- **Device and supplies status** -- View the current status of supplies in the printer.

If you have Internet access, select any of these items and then click **Go!** to open the corresponding HP Web page.

Change HP UPD properties (for all jobs or per job)

There are two ways to gain access to the HP UPD properties (print job preferences):

- **All jobs — From the Devices and Printers folder**—Recommended to change the default print settings for all applications that use this driver.
- **Per job — When printing from an application**— Recommended to change the print settings for a single print job or for print jobs during a single session in an application.

All jobs — from the Devices and Printers folder

NOTE: The changed settings apply as default settings for all print jobs in any application that uses this driver.

To gain access to the settings of the HP UPD, do the following:

1. Click **Start** and then click **Devices and Printers**.
2. In the **Printers** dialog box, right-click the print queue.

3. Click **Printer Properties**.

- When using the HP UPD in traditional mode, **Printer properties** display on screen.
- When using the HP UPD in dynamic mode, select a printer from the **Recently Used Printers** list, or find a printer, and then click **OK**.

4. Click the **Advanced** tab and then click **Printing Defaults**.

5. After making changes to the driver settings, click **OK**.

Per job — when printing from an application

NOTE: The changed settings apply only to the current print job or only to print jobs sent within the same session in that application.

When printing from an application:

1. In the application, select **File** and then **Print**.
2. In the **Print** dialog box, select the appropriate **HP Universal Printing PCL 6 or PS** printer.
3. Click **Properties**.

NOTE: The label for the button that opens the **Printer Preferences** dialog box varies between software programs. For example, in Adobe Acrobat on Windows 7 the button is labeled **Properties**. In Internet Explorer 11 the button is labeled **Preferences**.

- When using the HP UPD in traditional mode, you can now change the settings.
 - When using the HP UPD in dynamic mode, select a printer from the **Recently Used Printers** list, or find a printer, and click **OK**.
4. After making changes to the driver settings, click **OK**. The **Print** dialog box returns.
 5. Click **Print** to print the job according to the changed settings.

Incompatible Print Settings messages

Incompatible Print Settings (constraints) messages are unsolicited messages that appear in response to specific print-driver selections. These messages alert you to selections that are illogical or impossible given the printer capabilities or the current settings of other controls.

NOTE: Constraint messages are limited, and the underlying software architecture might accept some settings that are illogical or impossible for the printer to perform. Sending a job with incompatible settings can lead to unexpected results. If print jobs do not print as expected, check the printer documentation for the printer capabilities.

In supported Windows operating environments, some technically invalid print-driver configurations may result in warning messages. Duplexing, for example, is not possible when the Transparency paper type is selected. The following figure shows an **Incompatible Print Settings** message.



Figure 7-38 Incompatible Print Settings Message

To resolve the conflicting settings, click **Restore my previous settings** and then click **OK**. The driver resets the conflicting control back to its previous state.

If you want to keep the conflicting setting, click **Keep this setting, and I will change it later**, and then click **OK**.

NOTE: In this example, the conflict can be resolved manually. If the conflict is not resolved when the driver is closed, then the same dialog may appear again when a print job is sent to the printer.

Device Settings Tab Features

The **Device Settings** tab contains controls for paper-handling devices and for managing the printer. Available options vary depending on the specific product and feature.

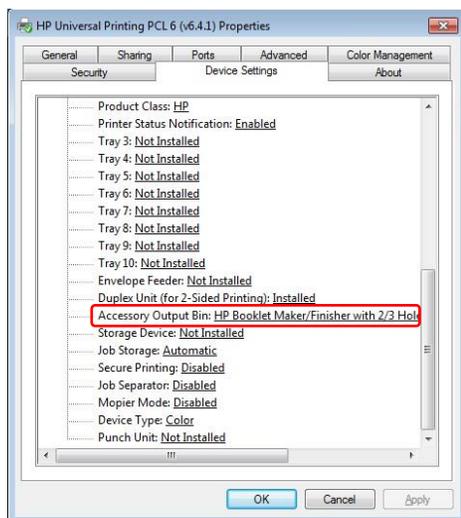


Figure 7-39 Device Settings Tab with Accessory Output Bin selected

NOTE: With HP UPD 6.4.1 and later, on most HP LaserJet printers introduced in the first half of 2017 and later, **Accessory Output Bin** is replaced with **Optional Output Bin**, listing the type of bin instead of the model number. Additional functions are added to the Device Settings tab in Printer properties to select the type of stapling and punch unit installed and whether a booklet maker, C-fold, or V-fold unit is installed, (see figure 7-40.)

NOTE: If an Accessory Output Bin is selected, settings for the Optional Output Bin, Stapling, Booklet Maker, C-Fold Unit, V-Fold Unit and Punch Unit are not displayed. If an Optional Output Bin is selected, Accessory Output Bin is not displayed.

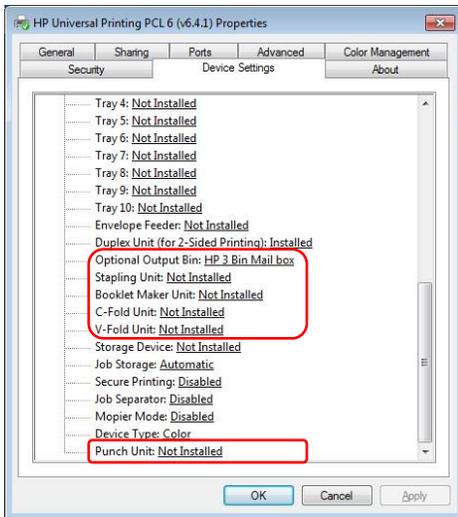


Figure 7-40 Device Settings Tab with Optional Output Bin selected (Capabilities mode)

NOTE: To verify which mode is supported, open the Device Settings tab in Printer Properties and see whether Accessory Output Bin or Optional Output Bin is listed. If Accessory Output Bin is displayed, the driver is using Device mode. If Optional Output Bin is displayed, the driver is using Capabilities mode.

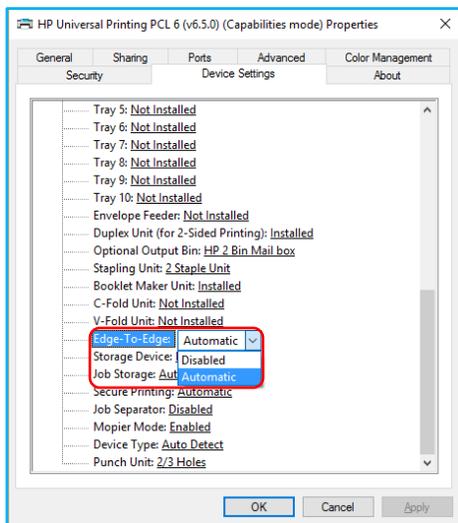


Figure 7-41 Device Settings Tab with Edge-To-Edge (HP UPD 6.5.0 and later)

NOTE: Edge-To-Edge is only supported on printers that support both Edge-To-Edge and Capabilities mode.

Table 7-13 Device Settings Tab

Feature	Function
Form to Tray Assignment	Legacy feature. Instead of using this legacy feature, set the paper size and type from the printer front panel and select the paper size and type in the driver when the document is printed.
Font Substitution Table	Legacy feature. The font handling capabilities within the latest Windows operating systems render these settings obsolete.

Feature	Function
External Fonts	<p>Installs and removes external fonts for the printer. External fonts can be soft fonts or DIMM fonts.</p> <hr/> <p>NOTE: The External Fonts is a legacy feature. The font handling capabilities within the latest Windows operating systems manage fonts for the user.</p>
Installable Options	<p>Automatic Configuration -- Use the Device Settings tab to tell the driver about the hardware configuration of the printer. If bidirectional communication is enabled in a supported environment, update this tab by selecting the Update Now setting in the Automatic Configuration setting. The default setting is Off. After changes are made through an automatic configuration, the setting returns to Off.</p> <p>If your environment does not support bidirectional communication, the Update Now setting is not available, so you must manually configure the options on this tab.</p> <p>If you have more than one driver installed for the printer (for example, the HP PCL 6 UPD and the HP PS UPD), the Update Now feature works automatically only on the driver on which it is activated. The other driver will not be updated, and might show the default settings for the specific printer model.</p> <hr/> <p>Product Class -- Lists the printer class of the device.</p> <hr/> <p>Tray 3 - X -- Specifies whether optional trays are installed on the product</p> <hr/> <p>Envelope Feeder -- Specifies whether an optional envelope feeder is installed on the product</p> <hr/> <p>Duplex Unit (for 2-Sided Printing) -- Specifies whether you have Duplex Unit installed on the printer.</p> <hr/> <p>NOTE: For printers that support smart duplexing, the printer uses the smart duplexing feature to detect whether there is information on both sides of the print job pages and only runs the pages through the duplexing unit if printable information appears on the second side of the page.</p> <hr/> <p>Accessory output bin -- Specifies whether there is an optional Output Bin installed on the printer and the model number of the device.</p> <hr/> <p>NOTE: Additional paper handling devices may be listed depending on the features of specific printers. See the user documentation for your printer for more information.</p> <hr/> <p>NOTE: With HP UPD 6.4.1 and later, on most HP LaserJet printers introduced in the first half of 2017 and later, Accessory Output Bin is replaced with Optional Output Bin, listing the type of bin instead of the model number. Additional functions are added to the list including stapling unit, booklet maker, etc. (see figure 7-40.)</p> <hr/> <p>Allow Manual Duplexing – If available, select Allow Manual Duplexing to print on both sides of any supported size and most types of paper (except transparencies, envelopes, and labels).</p> <p>To use this feature, you must reinsert the paper stack into the input tray to print the second side. The product pauses while you make this adjustment.</p> <p>This setting is enabled by default.</p>

Feature	Function
	<p>Edge-To-Edge – When this option is set to automatic and the printer supports edge-to-edge, select the Edge-To-Edge option in the Paper/Quality tab of Printing Preferences to print a document with 2 mm margins on supported devices. If this option is not selected, the document will be printed with standard margins.</p> <p>This feature is auto configurable in the Printer Properties Device Settings tab. By default it is set to automatic.</p> <hr/> <p>NOTE: Edge-To-Edge is only supported on printers that support both Edge-To-Edge and Capabilities mode.</p> <hr/> <p>Storage Device -- When this option is installed, the Job Storage option and the Mopier Mode are enabled in the print driver. Use the Job Storage option to store print jobs and then print them later from the printer front panel. The multiple-original print (mopy) function is an HP-designed feature that produces multiple, collated copies from a single print job.</p> <p>Job Storage -- When Job Storage is enabled (Automatic), the printer can store print jobs so that you can gain access to those print jobs later at the printer front panel</p> <p>Secure Printing -- When enabled (Automatic), HP Secure Encrypted Printing (SEP) is available for Personal and Stored Jobs.</p> <p>Job Separator -- Specifies whether a print job identifier page should be printed between print jobs.</p> <p>Mopier Mode -- The multiple-original print (mopy) function is an HP-designed feature that produces multiple, collated copies from a single print job. This feature increases performance and reduces network traffic by transmitting the job to the printer once, and then storing it in memory or on the hard disk. The remainder of the copies are printed at the fastest speed. All documents that are printed in mopier mode can be created, controlled, managed, and finished from the computer, which eliminates the extra step of using a photocopier.</p> <p>The printer supports the transmit-once mopying feature when the Mopier Mode setting on the Device Settings tab is Enabled.</p> <p>When you use the HP UPD, mopying is performed in one of two ways: either through the software or through the printer hardware. When mopier mode is enabled, mopying takes place through the printer hardware. One copy of a multiple-page print job is transmitted once through the network to the printer, together with a printer job language (PJM) command directing the printer to make the specified number of copies.</p> <p>When you disable mopier mode, you are not necessarily disabling multiple collated copies, which the driver can still perform through the software. Only the printer hardware path is disabled. However, a multiple-copy print job that is sent when the mopier is disabled loses the advantage of transmitting the print job once. The job is sent through the network for each collated copy.</p> <p>Device Type – Set by default to Auto Detect. If bidi is not working, you can specify a color device by selecting Color or select Monochrome to disable the Color tab.</p> <hr/> <p>NOTE: Even with a device type of Monochrome, the HP UPD might still send color data to the product. In some cases, the best print quality can be achieved by sending color data to a monochrome product.</p> <hr/>

NOTE: Status Notification Pop-ups (SNP) are no longer available starting with the release of UPD 6.5.0. On HP UPD v4.7 through UPD v6.4.1, SNP can be enabled or disabled from the Device Settings tab of the driver. Before HP UPD v4.7, SNP could only be disabled from the SNP dialog box.

With HP UPD 6.4.1 and later, on most HP LaserJet printers introduced in the first half of 2017 and later, **Accessory Output Bin** is replaced with **Optional Output Bin**, listing the type of bin instead of the model number. Additional functions are added to the list including stapling unit, booklet maker, etc.

Table 7-14 HP UPD 6.4.1 and later Output Devices Selected by Capabilities versus Model Number on New Printers

Feature	Available Settings*
Optional Output Bin	<p>With HP UPD 6.4.1 and later, on most HP LaserJet printers introduced in the first half of 2017 and later, Accessory Output Bin is replaced with Optional Output Bin, listing the type of bin instead of the model number.</p> <ul style="list-style-type: none"> • Not Installed • HP 2 Bin Mail box • HP 3 Bin Mail box • HP 5 Bin Mail box • HP 8 Bin Mail box • HP Stacker Bin • HP Collator Bin • HP Job Separation Bin • Optional Alternate Bin
Stapling Unit	<p>Specifies whether an optional stapling unit is installed on the product including the type of stapling unit.</p> <ul style="list-style-type: none"> • Not Installed • 1 Staple Unit • 2 Staple Unit • 3 Staple Unit
Booklet Maker Unit	<p>Specifies whether an optional booklet maker is installed on the product.</p> <ul style="list-style-type: none"> • Not Installed • Installed
C-Fold Unit	<p>Specifies whether an optional C-fold unit is installed on the product.</p> <ul style="list-style-type: none"> • Not Installed • Installed <p>C-fold uses two folds with the sheet folded into three nearly equal sections, with one panel serving as a cover, creating six panels for printed content. Often used for self-mailing brochures or pamphlets, letters, statements, invoices, bulletins, any letter size sheet (8.5" x 11") requiring insertion into a standard #10 or #9 envelope.</p>
V-Fold Unit	<p>Specifies whether an optional V-fold unit is installed on the product.</p> <ul style="list-style-type: none"> • Not Installed • Installed <p>For V-fold, the sheet is folded into two equal sections with a single fold, creating four separate panels or pages to be printed on. Often used for Bulletins, menus, programs, greeting cards, technical instructions, booklet pages.</p>

Feature	Available Settings*
Punch Unit	Specifies whether an optional punch unit is installed on the product including the type of punch unit. <ul style="list-style-type: none"> • Not Installed • 2/3 Holes • 2/4 Holes • 4 Holes-Swedish

* Available settings will vary depending on the printer and optional output device

Mopier mode and collation

Mopying and collating print jobs are independent but closely related functions. Mopying, the ability to send original print jobs to the printer, is performed by the print driver. Collating can be controlled by either the print driver or the document software program. The mopying mode is selected by default in the driver, and can be disabled by changing the **Mopier Mode** setting on the **Device Settings** tab in the **Printer properties** to **Disabled**.

Control collation through the print driver by selecting or clearing the **Collated** check box on the **Advanced** tab in **Printing preferences**. Click **Copy Count** under the **Paper/Output** setting. You can clear the check box, which is available only when the **Copy Count** option is set to more than 1 copy, to allow the software program to control collation.

To receive uncollated multiple copies of a print job, you must clear the **Collated** check box *and* make sure that the software program collation feature is not selected.

The following table shows the relation between mopier mode settings and collation settings in the software program and the driver. The first three columns show the settings; the last column, "Expected result", shows how a 3-page print job would appear.

Table 7-15 Driver Mopier Mode and Collation Settings

Mopier Mode	Application Collation	Driver Collation	Expected Result
Disabled	Not Selected	Not Selected	3 copies uncollated
Disabled	Not Selected	Selected	3 copies uncollated
Disabled	Selected	Not Selected	3 copies collated
Disabled	Selected	Selected	3 copies collated
Enabled	Not Selected	Not Selected	3 copies uncollated
Enabled	Not Selected	Selected	3 copies uncollated
Enabled	Selected	Not Selected	3 copies collated
Enabled	Selected	Selected	3 copies collated

Printer Automatic Configuration

Automatic Configuration enables the HP UPD driver user interface to reflect the supported capabilities of the target print device. Automatic configuration occurs through bidirectional communication between the product and a HP UPD. This communication can occur over the network or a USB direct connection. When the user installs the driver, the default printer model options will be base model. Successful implementation requires the HP UPD installed bidirectional services (Net Driver HPZ12 and Pml Driver HPZ12) are loaded, the correct port settings are set, and the target product is available for direct connect to the host or over the network. If the communication is successful, the printer options will be updated in the driver user interface.

This process of the HP UPD sending request and accepting responses directly between the driver and the device is referred as 'bidi' for bidirectional communication. The HP UPD user interface options will change to enable features of the target device based on the result of the response query (installable trays, Duplexer, Accessory Output Bin, HP EasyColor, etc.). If the communication is unsuccessful, the driver will still have base model functionality presented in the HP UPD user interface. Extended options will not be displayed or available for use during **File-Print**.

The benefit of Printer Auto-Configuration is enabling the driver to query the printer and recognize the product's capabilities with a level of automation and accuracy.

Printer Automatic Configuration can only be launched in the following methods:

- HP UPD driver installation (automatic update to all queues utilizing the HP UPD)
- **Dynamic mode**—Each time **Print** is selected from the HP UPD client.
- **Update Now GUI**—Traditional mode installations can manually launch through the HP UPD driver User Interface: **Printer Properties, Device Settings tab, Installable Options, Automatic Configuration, Update Now.**
- **UPDATE COMMAND LINE**—Traditional mode installations can execute a command line using Microsoft's Rundll32.dll allowing change updates to occur through scripting. (see [Command line interface](#)).

Automatic Printer Configuration status

Dynamic mode—Invoke Printer Automatic Configuration each time the HP UPD user interface is invoked (print properties for FILE-PRINT from the application).

Traditional mode—Printer Automatic **Configuration Status** can be determined by checking the **About** tab of the HP UPD available through the HP UPD Printer Properties.

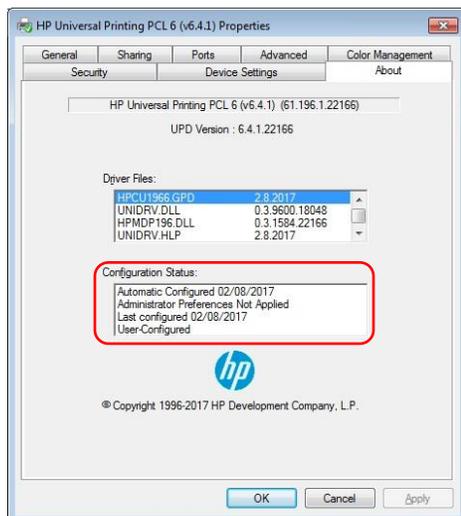


Figure 7-42 Printer Automatic Configuration status

Traditional Mode About status.

The **About** tab provides detailed information about driver component versions. It contains an overall build version number (in parentheses after the model name) together with specific information about each of the components. The information varies according to the printer model number, driver, date, and versions. The **About** tab is shown in the figure above.

- If the first line displays — **Automatic Configured MM/DD/YYYY**: Automatic configuration through the Printer Automatic Configuration successfully executed and updated the printer's configuration. Status of **Last Configured xx/yy/zzzz** displays date of the last attempted automatic configuration. The last line will display **Automatic Configured** or **User-Configured** if the original automatic configuration failed and running **Update Now** is successful.
- If the first line displays — **Auto-Configuration Not Attempted**: Automatic configuration could not update the configuration (i.e., unable to communicate with the printer). Status of **Last Configured xx/yy/zzzz** (third line) displays the date of the last attempted automatic configuration. The last line will display **Default Configuration**.

- If the first line displays — **Auto-Configuration Not Attempted**: Automatic Configuration is enabled, but Printer Automatic Configuration did not run. This would occur if the driver's Printer Automatic Configuration is enabled, but registering of the automatic configuration services (Net Driver HPZ12 and Pml Driver HPZ12) failed loading a DLL. The last line will display **Default Configuration**.

NOTE: If the Printer Auto-Configuration options have been disabled via driver pre-configuration, the Configuration Status box will show:

Administrator Preferences Not Applied
Last Configured xx/yy/zzzz (which is the date of install)
Default Configuration

The **About** button is also available on most driver screens. The **About** button provides a driver version number.

User interface

Traditional mode installations —The printer **Automatic Configuration** is automatically executed at the end of the installation routine. When the printer's capabilities have changed the **Update Now** process can be launched from the driver user interface to allow the HP UPD to query the target device: **Printer Properties, Device Settings** tab, **Installable Options, Automatic Configuration, Update Now** as shown below.

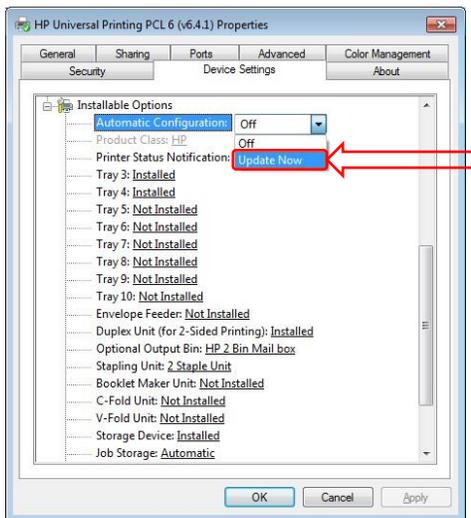


Figure 7-43 Selecting Update Now for Automatic Configuration through the Printer properties user interface

Automatic configuration selectable options

- **Automatic Configuration:= Off**: The update now bidirectional communication is not currently in progress
- **Automatic Configuration:= Update Now**: The driver is in process of communicating with the target product. This process can take several minutes depending upon the environment and configuration. When finished, the status will change to **Off**.

Dynamic mode installations—The Printer Automatic Configuration happens automatically using the following methods:

- Hitting **Print**.
- After **Enter a Printer Address**.
- Selecting **Check Status...** of an existing printer.
- Searching for products on the network subnet.

The configuration is automatically updated each time the client connects to the printer via the Dynamic mode connection.

Command line interface

Starting with HP UPD v4.0, administrators can script the **Update Now** process from a command line for traditional mode installations of the HP UPD driver. This applies only to HP UPD traditional mode installation. The files used and file location required for the configuration entry point are different with each printer **Automatic Configuration** release and are therefore Microsoft platform and HP UPD version specific.

Table 7-16 Platform specific commands for scripting the Update Now process

HP UPD version	Platform	Example command line
HP UPD v6.5.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\HP UPD 6.5.0: hpmux210.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 6.5.0: hpmux210.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v6.4.1	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\HP UPD 6.4.1: hpmux196.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 6.4.1: hpmux196.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v6.3.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 6.3.0: hpmux190.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 6.3.0: hpmux190.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v6.2.1	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 6.2.1: hpmux186.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 6.2.1: hpmux186.dll,UpdateStaticModePrinter "printer name here" /q</pre>

HP UPD version	Platform	Example command line
HP UPD v6.2.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 6.2.0: hpmux185.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 6.2.0: hpmux185.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v6.1.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 6.1.0: hpmux180.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 6.1.0: hpmux180.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v6.0.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 6.0.0: hpmux175.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 6.0.0: hpmux175.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.9.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 5.9.0: hpmux170.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 5.9.0: hpmux170.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.8.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 5.8.0: hpmux160.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 5.8.0: hpmux160.dll,UpdateStaticModePrinter "printer name here" /q</pre>

HP UPD version	Platform	Example command line
HP UPD v5.7.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 5.7.0: hpmux155.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 5.7.0: hpmux155.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.6.5	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 5.6.5: hpmux145.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 5.6.5: hpmux145.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.6.1	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 5.6.1: hpmux141.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 5.6.1: hpmux141.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD 5.6.0	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\UPD 5.6.0: hpmux140.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\UPD 5.6.0: hpmux140.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.5	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux130.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\hpmux130.dll,UpdateStaticModePrinter "printer name here" /q</pre>

HP UPD version	Platform	Example command line
HP UPD v5.4	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux118.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \64\3\hpmux118.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.3.1	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux115.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \64\3\hpmux115.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.2.6	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux112.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \64\3\hpmux112.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.2.5	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux111.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \64\3\hpmux111.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.2	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux109.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \64\3\hpmux109.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.1	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux104.dll,UpdateStaticModePrinter "printer name here" /q</pre>

HP UPD version	Platform	Example command line
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\hpmux104.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.0.3	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux094.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\hpmux094.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v5.0 Or HP UPD v5.0.1	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux091.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\hpmux091.dll,UpdateStaticModePrinter "printer name here" /q</pre>
HP UPD v4.7.2	32-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \w32x86\3\hpmux084.dll,UpdateStaticModePrinter "printer name here" /q</pre>
	64-bit	<pre>rundll32 %systemroot%\system32\spool\drivers \x64\3\hpmux084.dll,UpdateStaticModePrinter "printer name here" /q</pre>

Example steps to initiate Printer Automatic Configuration via command line

1. From the system's **Devices and Printers** folder, right mouse on the printer name and select **Printer properties**, **About** to locate the installed driver name instance and the HPMUX*.DLL (scroll down).

Note the **Printer Name** and Platform Specific DLL of the installed HP UPD.

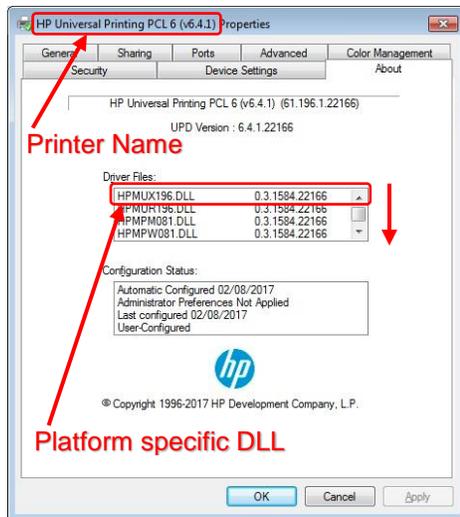


Figure 7-44 Locate the platform specific DLL

2. Open a command prompt: Click START, click RUN, type CMD.EXE and press Enter

```
C:\> rundll132
%systemroot%\system32\spool\drivers\w32x86\3\hpmux195.dll, UpdateStaticModePrinter
"HP Universal Printing PCL 6 (v6.4.0)" /q
```

User dialogue box opens stating, "Getting printer information... Establishing Communication with printer... Finishing printer validation"

3. Open the HP UPD Printer Properties About tab and check the **Configuration Status** box.

The status should display the current system date for **Last configured xx/yy/zzzz** and default options for the printer, or HP UPD pre-configurations of the driver will be displayed in the HP UPD user interface.

Disable Printer Automatic Configuration

UPD installed services provide bi-directional I/O capability outside the context of the user, application, or print job. Most printing functions will work without the driver to device communication, and print quality and speed are not affected by the services enablement. HP UPD 4.7 added support for manual configuration of the driver to both enable and configure device capabilities without requiring Automatic Update to be enabled. The Installable Options section of the UPD's Device Settings tab can be manually defined using Driver Configuration Utility or the Driver Deployment Utility.

Benefits comparison

NOTE: HP strongly recommends using Printer Automatic Configuration.

Automatic configuration enabled

- **Accuracy in Device capabilities:** Capabilities of the target device can change without end user awareness. Automatic configuration allows the UPD to accurately reflect the capabilities of the target device.
- **Staged deployment:** If the printers are not yet available, printer automatic configuration is a good option. The INSTALL.EXE utility will still create the port. The only consequence of not having the printer connected is that they would get the defaults for the printers, but a simple update now (user interface or command line) after the device is added to the host or network synchronizes the UPD driver to device capabilities.
- Manual configuration of every setting for every device connection introduces additional management overhead defining settings or correcting misconfigurations.
- Manual configuration requires managing multiple Driver Configuration Utility settings files (*.cf_ or *.cfm).

If bidirectional communication is successful followed by bidirectional communication failing on successive attempts, the driver user interface options will utilize cached settings of the last successful printer Automatic Configuration.

Automatic configuration disabled

- Administrators can disable printer automatic configuration to control which device capabilities are presented through the print user interface. For example, if a device supports a particular feature that does not comply with standard fleet deployment, the features enablement can be centrally controlled.
- **Pre-Installed queues:** Administrators can manually configure device capabilities regardless of the device's status on the network. For example, an administrator could define duplex printing in the driver without the device having to be on the network at the time of pre-configuration (the driver does not have to confirm the targeted device capabilities).
- The device is hooked up over an NDPS queue on a Novell Server.

Default capabilities without automatic configuration

Printer Automatic Configuration can be disabled through pre-configuration of the HP UPD driver. If the Automatic Update feature is disabled using the Driver Configuration Utility tool prior to the HP UPD's installation, standard printing defaults or cached settings will be utilized by the HP UPD.

If a capability is enabled though pre-configuration of the driver that the target device does not support, printing failures or unexpected results will occur. For example, setting duplex for a device that only prints simplex will output simplex.

Table 7-17 Defaults applied when the printer Automatic Configuration fails attempted communication

	PLC 6	Postscript
Trays	1,2	1,2
Manual Feed	Tray 1	Tray 1
Envelope Feeder	Not installed	Not installed
Duplex	Installed	Installed
Accessory Output Bin (Optional Output Bin)	Not installed	Not installed
Storage Device	Installed	Installed
Device Type	Monochrome (1)	Color (2)

NOTE: Device type can be changed to Color by reconfiguring the **Device Type** on the **Printer properties, Device Settings** tab. Some monochrome PCL 6 devices cannot handle color data. If color data is sent, the device will either generate an error or unexpected print output may occur.

NOTE: The Postscript driver always sends color regardless of device type. Monochrome devices are able to handle the color data properly. However, the driver **Color** tab might not display.

Steps to disable the Printer Automatic Configuration

Disabling the Printer Automatic Configuration is accomplished through pre-configuration of the UPD driver before installation onto the client or server. The Driver Configuration Utility is included in HP PARK which is available for download from the HP public Web site: www.hp.com/go/upd

NOTE: DCU is included with the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, which includes the HP DCU software and the *HP Driver Configuration Support Guide*, go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system (DCU is supported on both 32-bit and 64-bit systems). Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

1. Open the directory for the HP Driver Configuration Utility (HP DCU) in the HP PARK directory.
 2. Double-click HPBCFGAP.EXE to run the HP Driver Configuration Utility.
-

NOTE: The application automatically opens in the language specified within Region and Languages.

3. When the Information dialog box, click **OK**.
4. Click **File** and then **Open**.
5. Locate the HP UPD driver files and open the *.CFG file. If you have previously modified the driver, open the *.CFM file.
6. From the **Device Settings** tab, scroll down and select the **Automatic Configuration** drop down menu.
 - a. **Disabled**
 - Printer Automatic Configuration will not run at install time
 - **Auto Configuration** will be grayed out/disabled in the **Printer Properties** tab
 - **This setting will not apply to dynamic mode**
 - **Help About** in the **Configuration Status** box will display
 - Administrator Preferences Not Applied
 - Last Configured xx/yy/zzzz
 - Default Configuration
 - b. **Enabled (Device Settings Takes Priority)**
 - The default for AUTOMATIC CONFIGURATION.
 - c. **Enabled (Driver Pre-Configuration Takes Priority)**
 - The current Processing order for DMC / PRINTER AUTOMATIC CONFIGURATION
 - d. **Enabled (Limited Feature From Device)**
 - Similar to the UPD generic configuration with job storage disabled and no color tab
7. Modify any additional settings to your requirements.
8. Save the changes.

File-Save As: Allows you to select the file name and extension. If only a file name is entered, the application saves the file as (filename).cfg to the defined directory. In order to save the file as a cfm, you must type the extension .cfm after the file name.

NOTE: File-Save: Saves the file to the same filename from where it was opened, which may impact the digital signature. To not impact the digital signature, HP recommends using File-Save As and saving the file as a .cfm file.

9. Copy the cfm file to the ..\3 folder.

For 64 bit Windows- C:\Windows\system32\spool\drivers\x64\3
For 32 bit Windows- C:\Windows\system\spool\drivers\w32x86\3

NOTE: When copying the cfm file to the local machine driver directory, the cfm file name must have the format hpcpuxxx.cfm, where xxx matches the number of the cfg file. For example, hpcpu195.cfg would be named hpcpu195.cfm.

When using UPD 5.5.0 or later, you can use any file name, as long as it uses the extension .cfm, and the install.exe is used with the /gcfm option to install the printer. For example:

```
install.exe /gcfm"c:\temp\duplex.cfm" /n"PrinterName" /sm"HostName"
```

10. Install the driver using the supported method of deployment.

Communication protocols

Bidirectional communication between the HP UPD and the target device occurs directly (USB or parallel connection) or over the network:

- **SNMP over the network**—UDP ports 161 (snmp sets/gets).
- **HTTP over the network (Job Capabilities Ticket)**— a compressed file that can be sent to the UPD over http that defines specifications for the target device. JCT implementation in UPD v5 only includes paper sizes, paper type and HP EasyColor. Devices supporting JCT will also communicate SNMP information during bidirectional communication, therefore JCT supported devices might display more capabilities compared to non JCT supported devices.
- **PML over DOT4**—DOT4 is based on the IEEE 1284.4 protocol. For direct connect, DOT4 over USB or DOT4 over LPT is used for most devices. Many composite devices do not support DOT4 and might support an alternate directional mechanism.
- **Low end device model (LEDm) over Composite USB**—Beginning with UPD v4.7, the HP UPD can query low end laser models directly to get device configuration, status and alerts over composite USB. If the low end device is also networked, HP UPD printer automatic configuration will use the network.

Printer Automatic Configuration services

HP UPD installs two services that enable Printer Automatic Configuration to function. In combination these services allow the HP UPD to retrieve device configuration after installation, using UPDATE NOW, or via command line using RUNDLL32.

- **Net Driver HPZ12**—Provides channelized data transfers over the network for scan and fax
- **Pml Driver HPZ12**—For USB connected devices that support PML or for network SNMP, provides the ability to determine what features a device has using printer automatic configuration and device status.

Steps to Disable

By default, two UPD installed services are set to load Automatic. If the UPD is pre-configured prior to installation to disable Printer Automatic Configuration using the Driver Configuration Utility or HP Driver Deployment Utility, and the system installing UPD does not already have the HP UPD or other HP driver utilizing bidirectional communications, the HP UPD services will not be registered to the system.

If the "PML Driver HPZ12" is stopped and set to Manual, the service will restart when HP UPD Update Process is launched. If it is set to Disable, when the HP UPD Update Process is launched an error might be generated.

Steps to Remove

See [Uninstall the HP UPD](#) in chapter 5

Symptoms when Printer Automatic Configuration fails

When the HP UPD Printer Automatic Configuration services cannot communicate directly with the target printing device, the exact capabilities of the target device will be unknown to the installed HP UPD printer. Symptoms or observable changes to the HP UPD installed driver can include the following.

- Error message displays: This command could not be completed because a printer communication error occurred.
- No special device features or device attachments available for selection.
- Black and white printing only (even to color devices).
- No color tab.
- No duplex unit.
- No hard drive (no Job Storage tab).

Printing from a specified tray

HP products can select a paper by paper size and paper type. If multiple trays are loaded/configured for the same paper size, it is still possible to select a specific tray by using the paper type selection. Configure the paper types for the trays directly on the product or through the product's HP Embedded Web Server. Example of printer configuration:

- **Tray1: Size=Any Size; Type=Any Type**
- **Tray2: Size=Letter; Type=Letterhead**
- **Tray3: Size= Any Size; Type=Any Type or Plain**

To assign tray 2 as the default in HP UPD:

- Use the Driver Configuration Utility (found within the Print Administrator Resource Kit (PARK)) and pre-configure the HP UPD with the following settings before installing the HP UPD:
 - **Media Type: Unspecified**
 - **Paper Source: Tray 2**

Create a queue with the above settings.

- If the HP UPD has already been installed, go to the **Devices and Printers** folder, right click the HP UPD queue, click **Printer Properties, Advanced, Printing Defaults, Printing Shortcuts**, select **shortcut Factory Defaults** → **Paper Source**, select **Tray 2 as the Paper Source**, select **OK, Apply**.

Clients connecting using Point and Print will mirror the driver settings applied to the shared printer.

NOTE: Do not use **Form to Tray Assignment** accessible from the installed HP UPD's **Device Settings** tab for tray selection.

Known issue with redirected printers

Before making a remote desktop connection with a terminal server, you can specify if the local devices (such as printers) and resources should be visible in the remote session. If this option is used, then the locally installed printers with the HP UPD driver will be displayed as a redirected printer and can be used in the remote desktop session. When you open the redirected printers in the remote session, all redirected printers will not show the **Color** tab, even when the locally installed printers have color printing capabilities and a **Color** tab. Additionally, job storage will be displayed and extra trays are visible in paper source drop-down list in printing shortcuts while the paper source drop-down box in the **Print Quality** tab and in the special pages dialog box will only contain the Automatic selection.

NOTE: In windows 2008R2, a redirected printer will be visible in the **Devices and Printers** folder as "PrinterName (redirected #)", where PrinterName is the name of the Printer on the local windows PC from which the terminal session was started, and the # is the connection number to the terminal server.

Troubleshooting

Printer Automatic Configuration communication can fail with the device because of issues in the communication path. The client or network configuration might prevent communication, or the feature may have been disabled by the print administrator at install via driver pre-configuration. Take the following steps to isolate issues when Auto Configuration is not successful.

1. Can the HP UPD print to the target device?

No, then bidirectional communication might also fail because of connection issues between the HP UPD and the target print device.

2. Is the HP UPD printer defined with Printer Auto Configuration enabled?

Check the **Printer properties, Device Settings** tab. Under Installable Options, is **Automatic-Configuration** grayed out?

- a. No, run **Update Now** to check bidirectional communication
- b. Yes, then Auto-Configuration has been disabled either through driver configuration or by disabling the bidirectional communication services. Suggested steps:
 - o Are the Net Driver HPZ12 and PML Driver HPZ12 services installed (My Computer- Manage-Services or by NET START at the command line)?
 - o Reinstall the driver after confirming the source *.cfg file or *.cfm file has not been pre-configured to disable Printer Auto Configuration. If unsure, download the source driver package from www.hp.com/go/upd and perform a default installation without using the HP Driver Configuration Utility (DCU).

3. After running "Update Now" were the expected results returned?

- a. Check the **Printer Properties, About** tab and verify "Last Configured xx/yy/yyyy" date matches the Microsoft OS system date (confirmed by typing START -> RUN -> cmd /k date). If not, then Auto Configuration did not succeed.
- b. Was an error message returned, such as "This command could not be completed because a printer communication error occurred"?

Check for the correct port, port address, physical and logical connection to the target device.
- c. Paper types supported by the target device are not in the HP UPD user interface?

1. For some older devices, the HP UPD might not retrieve the full list of supported paper types. Instead, the HP UPD presents a subset of paper types, a generic list believed to be supported by most printers. Refer to the user guide for your product model if you have questions on supported paper types for your device.
2. Changes to the device's paper settings, such as paper size or paper type, using the HP Embedded Web Server, HP Web Jetadmin, or the control panel will not change or update the HP UPD driver display options. To change these so that they appear in the HP UPD driver user interface:
 - a) The end user must go to **Printer properties, Advanced tab, Printing Defaults** and manually change the settings.
 - b) Point and Print vended clients will see the defined setting under Printing Preferences
 - c) Pre-configuration of the HP UPD driver with the HP Driver Configuration Utility or the HP Driver Deployment Utility prior to install or reinstallation of the driver.

4. What is the physical connection method between the HP UPD installed printer and the target printing device?

Bidirectional communication between the HP UPD driver and the target device is possible through direct connection to the device or over the network by means of UDP. To confirm your connection method, right click the HP UPD in **Printers** folder, click **Print Properties**, and select the **Port** tab. Is the selected port defined correctly?

- No, set to the correct port type or port address (TCP/IP address or DNS name) and click **Apply**. Run **Update Now** under **Device Settings** to update the printer configuration in the driver.
- Yes, proceed to next steps.

5. Troubleshoot network connection/port

- a. Can you ping the target print product by the TCP/IP address? By host name?
- b. Can you ping the print server by the TCP/IP address? By host name?
- c. Is the HP UPD's target port defined by hostname or IP address?
- d. If by host name fails, is the hostname registered in DNS? `nslookup dns_name_of_device`
- e. Is the HP UPD installed client traversing network subnets to the target print server or printing device? If yes, is http and snmp traffic allowed through these connection paths? To define the segments in the network path, run the following from the HP UPD install client: `tracert print_device_ipaddress`
- f. Is the localhost or the target print server running an internet firewall? Are ports 160 and/or 80 open?
- g. Can the HP UPD client host gain access to the device's HP Embedded Web Server? `http://device_ip_address` or `https://device_ip_address`
- h. Are there network issues such as denial-of-service at the print server or printing device, network service interruption, or unauthorized and privileged access to the target print device or print server?
- i. Is the TCP filter enabled? **TCPIP, Advanced, Options** tab, **Properties** (types of traffic allowed to pass to the TCP protocol)?

6. Distinguish if target product is communicating bidirectional for printer auto configuration via HTTP or SNMP?

Bidirectional communication over the network could occur via HTTP and SNMP dependent upon target device. Errors specific to the protocol:

HTTP

- a. Does the device support hp job capabilities ticket? To determine,
http://device_ip_address/hp/device/JobCapabilities/JobCapabilitiesTicket.zip
- b. Is HTTP port 80/tcp enabled in the \ % SystemRoot %\System32\Drivers\Etc\services file?
- c. Does the HP UPD installed host firewall allow HTTP traffic?
- d. If the target product is on a separate subnet, does the network route HTTP traffic?

SNMP

- a. Do community names of the installed HP UPD host match the community name of target print product?
- b. Does the HP UPD installed host firewall allow SNMP traffic?
- c. If the HP UPD installed host is on a separate subnet, does the network route SNMP traffic?
- d. Is SNMP routing disabled? Wireless network security often disables SNMP routing as a security measure.

7. Install and test a new print queue?

Reducing complexity to isolate variables. A simple test is to install the HP UPD driver downloaded from www.hp.com/go/upd using the default installation options onto a clean system. This ensures the driver has not been pre-configured before installation, that upgrade from one version to the next in a contaminated environment is reduced, and the print queue itself is new and self-managed. During installation, create a new print queue targeted to a device with an address on the test machine's subnet.

8. Is the network congested?

HP UPD bidi uses the SNMP protocol, which is carried on the network using the HP UPD protocol. HP UPD packets are low priority, and can be discarded if the network is congested.

Frequently Asked Questions

1. For non-permanent instance installations of the HP UPD, will the printer be queried every time?

For cases where a user has chosen to create a permanent instance of a printer, settings are permanently saved to the local registry (like any other print driver) and the user would continue to print to that permanently created instance. For cases where a user has not chosen to create a permanent instance of a driver, registry entries are saved in a .CREG file (cached registry). Initially the driver will attempt to save the CREG files to the "C:\Program Files\Hewlett-Packard\HP Universal Printing" directory. If that directory is not available or is locked, the driver will attempt to cache settings in the %TEMP% then %TMP% directories. If neither of these directories are available then the HP UPD will query the printer every time for non-permanent instances.

2. How does enabling or disabling the Microsoft port **Enable bidirectional support** impact the HP UPD's bidirectional communication?

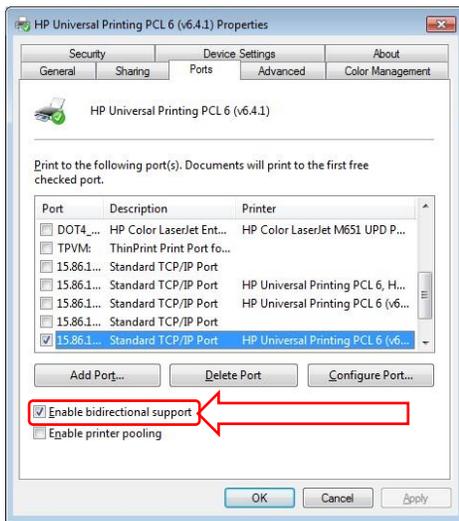


Figure 7-45 Enabling bidirectional support

The HP UPD uses the MS port's bidirectional communication for basic status level related to print spooler operations such as **Printer Online** and **Paper Out**. However, for product configuration and capabilities, the HP UPD uses its own installed services for bidirectional communication between the HP UPD and the target product (NET DRIVER HPZ12 and PML DRIVER HPZ12).

3. Does HP UPD Printer Auto configuration bidirectional communication cause slow print performance?

No, the traffic send/receive response is very small (SNMP around 65 kilobytes) and infrequent. For traditional mode installation, the HP UPD only queries for printer information at time of installation, when executed through Update Now or RUNDLL32 at the HP UPD installed client, and for a simple change id at the beginning of Printer Automatic Configuration job to verify that the configuration has not changed.

4. After the PRINTER AUTOMATIC CONFIGURATION has completed a successful bidirectional update, several device features appear in the HP UPD driver user interface that my device does not support. For example, why does the DEVICE SETTINGS tab show "Tray X: Not Installed" for several trays (where "X" is the tray number)?

The settings are place holders for the HP UPD. Because the HP UPD does not know before an Automatic or Pre-configuration of the driver's exact configuration, the HP UPD UI structure must remain capable of displaying settings beyond the standard default settings in the HP UPD UI design. By preserving the setting locations, after completing the Printer Automatic Configuration update, the user interface can dynamically update the "Not Installed" settings to the current configuration when a change has occurred to configuration of the device.

5. Print Properties-Device Settings-Installable Options, the Automatic Configuration option is grayed out and unavailable for selection. What could be the cause?

There are two possibilities that are dependent upon how the driver was installed onto the host.

- a. Point and Print connection, the driver is a printing client to print server connection. Updates would be centrally controlled from the print server and not the client. Therefore the print client would not initiate the Printer Auto Configuration between the print queue and the target printing product. However, printing clients can check their **Printer Properties, About** tab to display the server's last update status between the print server and printing target product:

Auto-Configured MM/DD/YYYY

Not Auto-Configured

Auto-Configuration Not Attempted

- b. Printing Automatic Configuration might be disabled by pre-configuration of the driver before the HP UPD was installed. This can be confirmed by checking the **Printer Properties, About** tab. The following will display if disabled by your Administrator:

Auto-Configured MM/DD/YYYY

Not Auto-Configured

Auto-Configuration Not Attempted

6. Is there a good method for testing Printer Automatic Configuration?
 - a. Install HP UPD with default options (do not utilize switches on the INSTALL.EXE command line) using an HP default driver package downloaded from www.hp.com/go/upd. This step ensures the driver has not been pre-configured.
 - b. During installation, create a new printer port with an invalid TCP/IP address. During the HP UPD installation, the Automatic Configuration will attempt to communicate with the invalid device IP address. Install will complete without error and provide default options. For example, the **Color** tab will not display because automatic configuration could not validate a color printer at the defined TCP/IP address.
 - c. For the newly installed HP UPD printer, check Printer Automatic Configuration is enabled (**Printer Properties, Device Settings** tab, **Installable Options, Automatic Configuration, Update Now**)
 - d. Check the **Printer Properties, About** tab and note the "Last Configured xx/yy/zzzz" which identifies if Printer Automatic Configuration has communicated with the target device.
 - e. Change the HP UPD install printer TCP/IP port address to a valid device IP address.
 - f. Run the HP UPD's Printer Automatic Configuration through the HP UPD user interface or the command line specific to the installed UPD version (see [Command line interface](#)).
 - g. Check the device capabilities updated from the default settings.
7. Does the following message, "Windows Security Alert: Spooler Subsystem App" generated during the installation relate to the HP UPD's installed bidirectional communication services over the network?

The HP UPD installation can make calls over the network utilizing different ports and communication protocols for configuration, device capabilities, and status. For example, ports 160 and 80 might all be utilized in the Printer Automatic Configuration process when the HP UPD communicates bidirectional over the network to the target device. If the ports used by the print spooler are not open, the firewall might need to be configured.

8. Is there a tool or steps to test SNMP port access required by the HP UPD printer automatic configuration?

The SNMP port utilization by HP UPD will not be active until traffic is being sent or received during the Update Now process. Full diagnosis involves checking port access at all connection points of the network between the HP UPD printing client and target device (gateway/routers/switches/server and host firewalls). Utilities to help troubleshoot connection path access can include Net Print, netstat, traceroute, and pathping to identify network device access. The SNMP port utilization by HP UPD will not be active until traffic is being sent or received during the Update Now process making a network sniffer one of the best tools for diagnostics during the update process.

9. Why does **RGB color** from the **Color** tab only have a **NULL** option?

The **Color Themes** from the **Color** tab in the HP UPD properties is device dependent. The HP UPD configures the settings based on the model name. If the **Device Type** is set to **Color** in the **Device Settings** tab (DCU or manually) and if there is no bidi communication with the color product, then the HP UPD displays **NULL**. When using the PCL 6 driver, the **HP EasyColor** option is not available either.

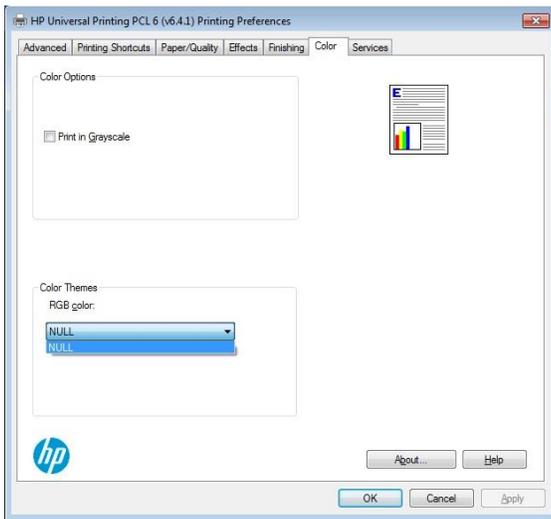


Figure 7-46 Null Option

10. Does the HP UPD support SNMP v3?

SNMP v3 is not supported by the UPD, therefore SNMP v3 enabled or disabled at the HP printer has no impact on UPD SNMP v1/2 print, status or configuration. The HP UPD supports SNMP v1/2. All HP devices supported by the HP UPD are v2 compatible.

11. Is SNMP required by the HP UPD for printing?

No, the SNMP stack installed by the HP UPD is only used for returning printer configuration and printer status back to the printer driver. However, if the Microsoft SNMP stack utilized between the Microsoft spooler and printer are incorrectly configured (i.e. SNMP name mismatch, or enabled on one side but not the other) the HP UPD printer object may show the status "Offline."

12. What steps should be taken to confirm SNMP v2 community name alignment exists between the printer, the HP UPD SNMP stack, and MS SNMP stack?

The HP UPD SNMP community name defaults to 'public'. Use any of the following methods to modify the SNMP v2 community name:

Modify the SNMP v2 community name during installation

- Use the following install switch:

```
/qcomname (defined queue) or /gcomname (global)
```

For example: `Install.exe /q /h /npf /tm /n"printer name" /nd /ni /qcomname"newame"`
for Microsoft's SNMP spooler community name

Modify the SNMP v2 community name for an existing print queue

1. From the **Start** menu, select **Devices and Printers**.
2. Right click on the printer and then select **Printer Properties**.
3. Click on the **Ports** tab and then click the **Configure Ports** button.
4. Select **SNMP Status Enabled** and then enter the SNMP v2 community name in the **Community Name:** field.
5. Click **OK**.

Modify the SNMP v2 community name using the EWS

1. Open a web browser and then navigate to the product's EWS by using the product's IP address.
2. In the product EWS, click the **Network** tab.
3. Click the **Network Settings** link in left navigation panel.
4. Select **Enable SNMPv1/v2 read-write access**, and then enter the SNMP v2 community name in the **Community Name:** field. Enter the same SNMP v2 community name in the **Confirm Set Community Name:** field, and then click the **Apply** button.

NOTE: SNMP community name cannot be blank, or end in a numeric (characters 0 through 9 are reserved for multiport jet direct box functionality).

13. How is SNMP utilized in the HP UPD?

The HP UPD's SNMP stack provides Automatic Configuration between the HP UPD print object and the HP print device, the Status Notification Popup after a new printer install and FILE-PRINT to HP UPD printer, and the status message prompt for a manual duplex print job.

NOTE: Status Notification Pop-ups (SNP) are no longer available starting with the release of UPD 6.5.0.

GET operations are used by the HP UPD (requestor) and the device (responder) over TCP/IP or DOT4 connections. SET is not utilized by the HP UPD.

The HP UPD SNMP v2 functionality requires that the SNMP community name match between the HP UPD SNMP stack, the Microsoft SNMP stack, and that the print device SNMP settings align the Community Name in three places: in the HP UPD printer object, the Microsoft operating system spooler, and the HP print device.

14. For point and print connected clients, is there SNMP v2 activity initiated from the client?

On the point and print client, settings on the **Device Settings** tab are greyed out, including **UpdateNow**. The client receives automatic configuration settings and changes from the print server, not directly from the print device.

8 Managing the HP UPD with Active Directory Group Policy

Introduction

Active Directory Group Policy and the HP UPD Active Directory Administrator template allow complete management of the HP UPD printing experience within your Active Directory infrastructure.

You can use the HP UPD Active Directory Administrator Template to add policies to an existing Group Policy Object or create new, custom HP UPD Group Policy Objects for each user, group, or Organizational Unit.

In addition to creating policies for the HP UPD, you can also enter the location of Managed Printer Lists by exporting printer groups from your HP Web Jetadmin database in XML format.

This chapter covers the following topics:

- [Supported HP UPD versions](#)
- [You-Tube Video](#)
- [Use HP Active Directory Group Policy to manage HP UPD policies](#)
- [HP UPD Active Directory Group Policy](#)

Supported HP UPD versions

The HP UPD Active Directory Group Policy version 4.3.6 and higher is supported with HP UPD version 5.4.0 and higher, and is available for download at www.hp.com/go/upd.

For more information about each release, see the HP UPD Active Directory Administrator Template release notes.

NOTE: When using an AD template, if you open an application's print dialog after initially connecting to the queue and without ever opening printing preferences or printer properties, the application's print dialog may not reflect the policy depending on how the application is accessing devmode and which devmode it is accessing. However, it should print correctly based on the policy. To update the application's print dialog, you need to access the print driver by opening printer properties or printing preferences through the application or printers folder.

You-Tube Video

For more information on using AD templates, see the You-Tube video "Using HP Active Directory Administrator Templates" at <http://youtu.be/UUN2sEggnuc>.

Use HP Active Directory Group Policy to manage HP UPD policies

The decision to use HP Active Directory Group Policy to manage the HP UPD depends on the size of your business and the current software infrastructure within your business.

In an enterprise business, use Active Directory Group Policy when your enterprise environment requires user and Organizational Unit (OU) level HP UPD configuration settings that might be based on how the users are currently configured in your Active Directory. The HP UPD Active Directory Administrator template integrates into an existing Active Directory infrastructure and allows for creation of group Policy Objects to be linked to user groups and OUs. An experienced Active Directory administrator will be able to easily integrate the HP UPD Group Policy objects in large enterprise environments.

HP UPD Active Directory Group Policy

Introduction

There are two HP UPD Active Directory Administrator Templates, ADM template and ADMX/ADML templates. On newer operating systems, such as Windows Server 2008R2, you can use ADM templates or ADMX/ADML templates.

Further details on ADMX templates can be found on: technet.microsoft.com/en-us/library/cc709647%28v=ws.10%29.aspx

Background information:

Unlike ADM files, ADMX files are not stored in individual GPOs. For domain-based enterprises, administrators can create a central store location of ADMX files that is accessible by anyone with permission to create or edit GPOs.

The following sections provide installation instructions for both types of templates and additional template information:

- [Install and use the ADM template using Microsoft Group Policy Management Console \(GPMC\)](#)
- [Install and use the ADMX/ADML template using Microsoft Group Policy Management Console \(GPMC\)](#)
- [Remove the HP UPD Administrator template](#)
- [Upgrade the HP UPD Administrator template](#)
- [Enable Active Directory Group Policy for HP UPD for a new or existing HP UPD installation](#)
- [Configure policies with the HP UPD Active Directory Administrator template](#)
- [Implement Managed Printer Lists \(MPLs\) within the HP UPD Active Directory Administrator Template file](#)
- [Verification and troubleshooting](#)

Install and use the ADM template using Microsoft Group Policy Management Console (GPMC)

The following procedure provides details for creating and linking group policy objects using Microsoft Group Policy Management Console (GPMC). The following example creates a group policy object and sets it as the default policy for the entire domain, which in this case is named **test.local**. The procedure is similar for creating and linking group policy objects for organizational units and groups.

1. Download the HP UPD Active Directory Administrator Template as part of the HP Printer Administrators Resource Kit (HP PARK). Go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.
2. Extract the contents of the HP PARK zip file to your hard drive.
3. Locate the folder where you extracted the HP PARK zip file and browse to the **active directory administrator template** folder.
4. Copy the template (**HP_MPP_*.adm**) to the `\windows\inf` directory on the domain controller server.
5. Open the **Microsoft Group Policy Management Console**.
6. Right-click the server name **test.local**.
7. Click **Create and Link a GPO here**.
8. Give the new GPO a name and click **OK**.
9. Right-click the new Group Policy object in the right-most window pane.
10. Click **Edit**. The **Microsoft Group Policy Management Editor** opens (`gpedit.msc`).
11. Select **User Configuration**, select **Policies**, select and right-click **Administrative Templates**, and then select **Add/Remove Templates**.
12. Browse to and select the HP UPD Active Directory Administrator Template (for example, `HP_MPP_4.4.9.adm`).

Install and use the ADMX/ADML template using Microsoft Group Policy Management Console (GPMC)

The following procedure provides details for creating and linking group policy objects using Microsoft Group Policy Management Console (GPMC). The following example creates a group policy object and sets it as the default policy for the entire domain, which in this case is named **test.local**. The procedure is similar for creating and linking group policy objects for organizational units and groups.

1. Download the HP UPD Active Directory Administrator Template as part of the HP Printer Administrators Resource Kit (HP PARK). Go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.
2. Extract the contents of the HP PARK zip file to your hard drive.
3. Locate the folder where you extracted the HP PARK zip file and browse to the **active directory administrator template** folder.
4. When using the Local GPO: Copy the ADMX template (**HP_MPP_*.admx**) to `%systemroot%\PolicyDefinitions\` and copy the ADML file (**HP_MPP_*.adml**) to `%systemroot%\PolicyDefinitions\en-US`

When using the Domain based GPO with a central store: First create a Central store, see technet.microsoft.com/en-us/library/cc748955%28v=ws.10%29.aspx. Copy the ADMX template (**HP_MPP_*.admx**) to `%systemroot%\sysvol\domain\policies\PolicyDefinitions` and copy the ADML file (**HP_MPP_*.adml**) to `%systemroot%\sysvol\domain\policies\PolicyDefinitions\EN-US`

5. Open the **Microsoft Group Policy Console**.
6. Right-click the server name **test.local**.
7. Click **Create and Link a GPO here**.
8. Give the new GPO a name and click **OK**.
9. Right-click the new Group Policy object in the right-most window pane.
10. Click **Edit**. The **Microsoft Group Policy Object Editor** opens (gpedit.msc).
11. Select **User Configuration**, click **Policies**, select **Administrative Templates**, and then select **HP Managed Print Policies x.y.z**.

Remove the HP UPD AD Administrator template

1. Open the Microsoft Group Policy Editor.
2. Click **User Configuration**, click **Policies**, click **Administrative Templates**, and then click **HP Managed Print Policies**.
3. Set each of the policies to **Not configured**.
4. Click **Administrative Templates**, and select **Add/Remove Templates**.

NOTE: Failure to set all the template settings to **Not configured** before removing the template will leave registry settings that are no longer associated with an administrator template, resulting in errors when the **Group Policy Modeling Wizard** is run.

Upgrade the HP UPD AD Administrator template

To upgrade the HP UPD AD Administrator template, follow the steps to remove the old template in [Remove the HP UPD AD Administrator template](#) in this chapter, then follow the steps to install the new template in [HP UPD Active Directory Group Policy](#) in this chapter.

Enable Active Directory Group Policy for HP UPD for a new or existing HP UPD installation

For new installations of the HP UPD when an HP Active Directory Administrator Template is installed

NOTE: When using HP UPD 5.X.X or later and the latest version of the HP Active Directory Administrator template (version 4.4.5 or later), the policy can be enabled directly from the template settings, so no special installation switches are required.

For existing installations of the HP UPD

To enable your existing installations of the HP UPD to recognize the Active Directory group policies, use the following procedure for every HP UPD GPO that you create.

1. Open the **Microsoft Group Policy Management Editor** (gpedit.msc)
2. Select **User Configuration**, **Policies**, **Administrative Templates**, **HP Managed Print Policies**, **UseMode Settings**.
3. Open **General Settings**, click **Enabled**, and check **Enable Policy for all users**, and then click **OK**.

Configure policies with the HP UPD Active Directory Administrator template

To manage and configure the HP UPD Policies settings, open the Microsoft Group Policy Management editor and select **User Configuration, Policies, Administrative Templates**, and then **HP Managed Print Policies**.

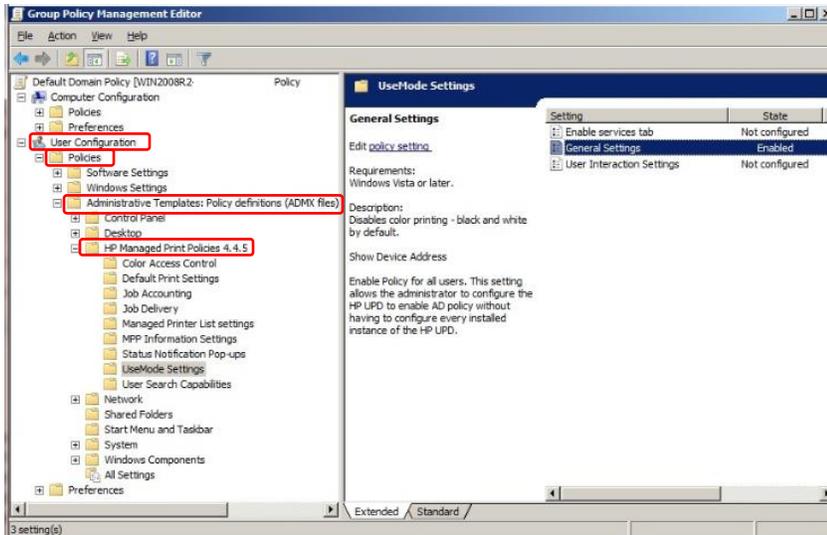


Figure 8-1 Microsoft Group Policy Management editor

NOTE: When configuring policies with the HP UPD Active Directory Administrator template, make sure to enable the General Settings under UseMode Settings and select **Enable Policy for all users**. This setting allows the administrator to configure the HP UPD to enable AD policy without having to configure every installed instance of the HP UPD.

Configuring the policies for the HP UPD is similar to configuring any other Group Policy within the Active Directory Group Policy environment.

The following are policies that are part of the HP UPD Active Directory Administrator Template.

UseMode Settings: General Settings

Table 8-1 UseMode Settings: General Settings

Option	Description
Not Configured	
Enabled	<p>Select this option button to make the following options available:</p> <ul style="list-style-type: none"> • Disable Color • Show device address • Enable Policy for all users. This setting allows the administrator to configure the HP UPD to enable AD policy without having to configure every installed instance of the HP UPD.
Disabled	

NOTE: When configuring policies with the HP UPD Active Directory Administrator template, make sure to enable the General Settings under UseMode Settings and select **Enable Policy for all users**. This setting allows the administrator to configure the HP UPD to enable AD policy without having to configure every installed instance of the HP UPD.

UseMode Settings: User Interaction Settings

Table 8-2 User Interaction settings

Option	Description
Not Configured	
Enabled	<p>Select this option button to make the following options available:</p> <ul style="list-style-type: none"> • Restricted Mode check box • Show UPD dialog settings window check box • Allow user to group printers by location check box • Allow user to add printers to OS Printers folder check box • Device verify level drop down. <ul style="list-style-type: none"> ○ (Do not specify) ○ Verify communication and compatibility with driver (High) ○ Verify device ID and Model Name can be obtained (Medium) ○ Verify port can be opened for printing (Low) • When printing. <ul style="list-style-type: none"> ○ (Do not specify) ○ Always prompt for the destination when printing a job ○ Only prompt if the last known destination is no longer available ○ Only prompt the first time a job is printed from an application
Disabled	

UseMode Settings: Enabled Services tab

Table 8-3 UseMode Settings Enabled services tab

Option	Description
Not Configured	
Enabled	<p>Select this option button to make the following options available:</p> <ul style="list-style-type: none"> • Enable online diagnostics • Enable driver updates • Enable online support • Enable supply ordering • Enable product manuals
Disabled	

Default Print Settings

NOTE: When the Default Print Settings Properties window is set for Not Configured, the HP UPD uses the driver defaults for the settings.

Table 8-4 Default Print Settings

Option	Description
Not Configured	
Enabled	<p>Select this option button to make the following options available:</p> <ul style="list-style-type: none"> • Duplex drop down <ul style="list-style-type: none"> ○ Driver Default ○ Print on both sides ○ Print on both sides–Flip pages up ○ Print on both sides–Flip pages up–Lock ○ Print on both sides Lock • Grayscale Default drop down <ul style="list-style-type: none"> ○ Off ○ On ○ On - Locked • Economode drop down <ul style="list-style-type: none"> ○ Driver Default ○ Economode On ○ Economode On–Locked • Job Storage drop down <ul style="list-style-type: none"> ○ Driver Default (Off) ○ Personal Job with Secure Print ○ Personal Job with Secure Print Locked ○ Private Job ○ Private Job - Lock ○ Private Job (requires PIN) ○ Private Job (requires PIN) - Lock ○ Proof and Hold ○ Proof and Hold - Lock ○ Quick Copy ○ Quick Copy–Lock ○ Stored Job (requires PIN) ○ Stored Job (requires PIN) - Lock ○ Stored Job with Secure Print ○ Stored Job with Secure Print Locked • Private Print Pin • Secure Print password • Edgeline QAC. <ul style="list-style-type: none"> ○ Driver Default ○ Professional ○ General Office ○ Black and White ○ Professional - Lock ○ General Office - Lock ○ Black and White - Lock • Print Quality drop down <ul style="list-style-type: none"> ○ Driver Default ○ Draft/General Office ○ Normal/Professional ○ Draft/General Office – Lock ○ Normal/Professional – Lock • Allow users to permanently change settings from the user's Devices and Printers folder
Disabled	

Color Access Control: Application Filtering

Table 8-5 Color Access Control: Application Filtering

Option	Description
Not Configured	
Enabled	Select this option button to make the following options available. <ul style="list-style-type: none">• Exclude these Applications check box<ul style="list-style-type: none">○ Name: field(s)
Disabled	

Color Access Control: Time of Day Restriction

Table 8-6 Color Access Control: Time of Day Restriction

Option	Description
Not Configured	
Enabled	Select this option button to make the following options available: <ul style="list-style-type: none">• [Day] drop-down menu.<ul style="list-style-type: none">○ Specify time○ Allow Color all day○ Restrict Color all day• Hour On: field• Hour Off: field
Disabled	

User Search Capabilities

Table 8-7 User Search Capabilities

Option	Description
Not Configured	
Enabled	Select this option button to make the following options available: <ul style="list-style-type: none">• Network print shares check box<ul style="list-style-type: none">○ Allow users to browse for and use printer shares on the network.• Network printers check box<ul style="list-style-type: none">○ Allow users to search for and use TCP/IP printers connected to the network.
Disabled	

Status Notification Pop-ups

NOTE: Status Notification Pop-ups (SNP) are no longer available starting with the release of UPD 6.5.0. On HP UPD v4.7 through UPD v6.4.1, SNP can be enabled or disabled from the Device Settings tab of the driver. Before HP UPD v4.7, SNP could only be disabled from the SNP dialog box.

Job Accounting

NOTE: Job accounting and Job delivery are no longer supported in HP Active Directory Administrator template.

Job Delivery

NOTE: Job accounting and Job delivery are no longer supported in HP Active Directory Administrator template.

MPP Information Settings

Table 8-9 MPP Information settings

Option	Description
Not Configured	
Enabled	Select this option button to make the following options available: <ul style="list-style-type: none">• Info Link Name: field• Info Link URL: field
Disabled	

Managed Printer List settings

Table 8-10 Managed Printer List settings

Option	Description
Not Configured	
Enabled	Select this option button to make the following options available: <ul style="list-style-type: none">• Custom MPL Count: selection box• HP MPL Only check box• Custom MPL [#]:—(up to 40)<ul style="list-style-type: none">○ Name: field○ Path: field○ Type drop-down menu<ul style="list-style-type: none">▪ Standard UPD MPL▪ Web JetAdmin XML MPL
Disabled	

Implement Managed Printer Lists (MPLs) within the HP UPD Active Directory Administrator Template file

Printer lists for use in the Active Directory Group Policy environment are created outside the Active Directory Group Policy object, and linked to the HP UPD Active Directory Administrator template within each Group Policy Object. Create Managed Printer Lists by exporting printer lists from HP Web Jetadmin. For each policy created, up to 40 Managed Printer Lists can be selected.

- **Custom MPL Count.** This number must match the number of printer lists entered.
- **HP MPL Only.** Uncheck this. Check this if the printer lists have been created by, and exported from, the HP MPA software tool.

NOTE: HP MPA is no longer supported.

- **Name.** This is the name displayed for each group.
- **Path.** The information in the **Path** field depends on the type of MPL and the location of the data. In these examples, the data is on an http Web server.

NOTE: The path string consists of a prefix like http, and a folder or subfolders separated by a colon(':').

- If the data is XML (exported from HP Web Jetadmin), the prefix is http.
- **Type.** Choose the correct type of printer list being selected.
 - **Web JetAdmin XML MPL** for printer lists exported by HP Web Jetadmin

Verification and troubleshooting

Use this section to verify that the users are obtaining the HP UPD policies correctly. In addition, use this section as a guide to see where to apply settings.

Functional test

1. Use the group Policy Modeling tool to run simulations on specific users or groups and specific machines.

NOTE: The GPMC is a Microsoft supplied tool and is an optional component on server versions that can be downloaded from the Microsoft Web site.

2. Run the modeling wizard to verify your settings.
3. Right-click **Group Policy Modeling**.
4. Click **Group Policy Modeling Wizard**.
5. Enter the user that you want to model.
6. Select the **Skip to the final page** check box.

Registry population

Use this test to verify that the settings in the group policy object populate in the registry of the client computer.

1. Verify that the current user is logged into the domain.
2. Run regedit.exe and verify that the registry populates correctly. The registry path is HKCU/Software/Policies/Hewlett-Packard/HP Print Settings/ADSPrintPolicy.
3. Verify the Binary Registry key "UPDADS" exists at registry path HKCU/Software/Hewlett-Packard/HP Print Settings.

NOTE: Active Directory does not refresh settings immediately after you make a change to the Group Policy object. To refresh the settings on the client, you must log out and then log back in, or you can use the gpupdate utility with the /Force option run from a command window to force Active Directory to update the settings.

Example: `c:/> gpupdate /Force`

Final test

Install the latest version of the HP UPD and verify that the screens and final print reflect the policy settings entered in the Group Policy Editor (gpedit.msc).

How HP AD policies get applied to the driver

Unlike DCU configured drivers, AD policies are dynamic policies. After the driver installation, the administrator can change the policies from the server, and those changes get applied to all the clients. The drivers on the clients will reflect the new policy.

For this to work, the HP UPD driver keeps on monitoring for policy changes, whenever a user tries to open the Printing Preference or Printer Properties, or when the user tries to print. In these scenarios, if the HP UPD detects that there is a policy change, it applies the new policy to the printer queues, and during this policy application process, the HP UPD briefly opens up a dialog which shows the progress of the policy application.

<content.unit><para></para></content.unit>

The policy application status window looks similar to this:



Figure 8-2 Policy application status window

Table 8-11 When policies will be applied to queues

Scenario	Action
The driver is installed with static mode and is in an AD environment where there was no policy, but after the driver installation, the administrator set a policy.	The dynamic policy application will take place.
The driver was installed after the policy was set on the server.	The policy will be applied during installation, and the dynamic policy application will not take place until further policy changes.
The driver was installed after the policy was set, but after installation, the policies were changed from the server.	The dynamic policy application will take place.
The driver is installed in Dynamic mode.	The policies are always applied when trying to open the Printing preference depending upon the refresh policy.

NOTE: The dialog that is coming up when opening the printing preferences for the first time, is actually an expected behavior. The driver is applying the policies, and once the policies are applied, the driver does not try to apply it again unless there is a change in the policies.

9 Using Managed Printer Lists

Introduction

Managed Printer Lists (MPLs) are XML documents that provide the information required for print jobs to use printing products. These centrally managed XML documents contain the printer details to assist users in finding supported printers for printing with the HP UPD for Windows. MPLs provide administrators with the ability to specify the products that users can use for printing.

MPLs create a reliable and seamless way of discovering and connecting to products in the office or to public printing venues.

MPLs allow users to select a printer with a descriptive name from a predefined list. Users do not need to know about network print shares, TCP/IP addresses, printer host names, user access permissions, or other printer connection details. Instead, users select a printer from the list dialog box and print.

Who should use MPLs?

MPLs can simplify printing for users and improve administrator control over the environment. Costs savings in productivity, security, support, and supplies frequently justify the effort of implementing MPLs. HP Universal Print Driver offers two methods to install the UPD, Traditional and Dynamic mode. MPLs are only supported when UPD is installed in Dynamic mode.

Any business with a supported Microsoft Windows printing environment can benefit from the flexibility and ease of use that MPLs provide. For example,

- Hotels that offer printing to their guests who log in to their private network can use the HP UPD with MPLs to quickly connect to in-room or centrally located printers.
- Restaurants, coffee shops, and other printing hot spots that provide Internet access can also define HP MPLs to allow guests to quickly connect to printers on their premises.
- Enterprise environments with large campuses or offices spread across countries/regions can greatly benefit from MPLs, especially the mobile users who travel from site to site or building to building.

MPLs support administrative personnel responsible for managing printers and printing within their environment. Depending on the configuration of the HP UPD on the client machine, MPLs can either simplify printer discovery for users or restrict printing to a defined set of printers within the environment.

Exporting a new MPL from HP Web Jetadmin

HP UPD's Managed Printer List requires a properly formed XML document. HP recommends utilizing HP Web Jetadmin to create a properly formed XML document for use with HP UPD.

NOTE: For information on using HP Web Jetadmin, see the documentation and online help for HP Web Jetadmin.

1. From HP Web Jetadmin 10.4, access the device list you want to Export
2. Highlight the printers you want to export

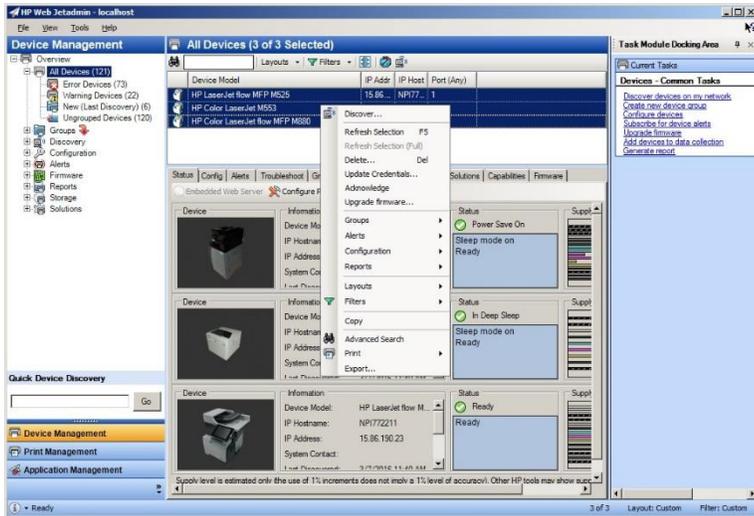


Figure 9-1 Exporting Printers from Web Jetadmin

3. Right-click anywhere on the list and select Export

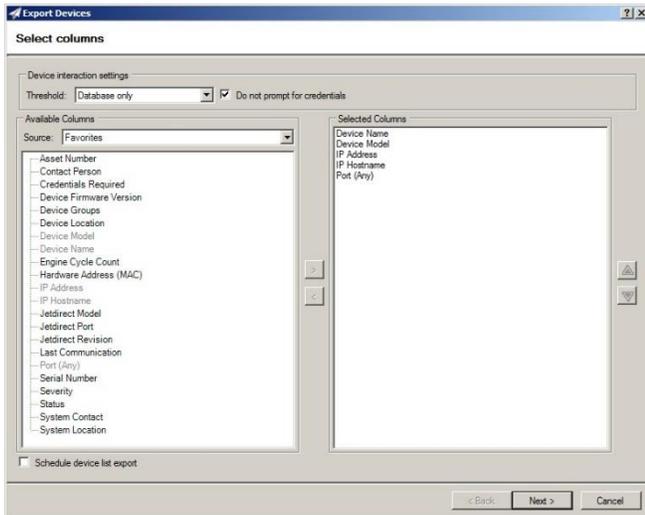


Figure 9-2 Specifying Export Settings

4. Specify the type of data to export (selected columns) including Device Name, Device Model and IP Address

- The following columns are required:
 - Device Name – Configured in device
 - Device Model – Not user configurable, referred to as Display Name in XML
 - IP Address or IP Hostname

5. Click Next

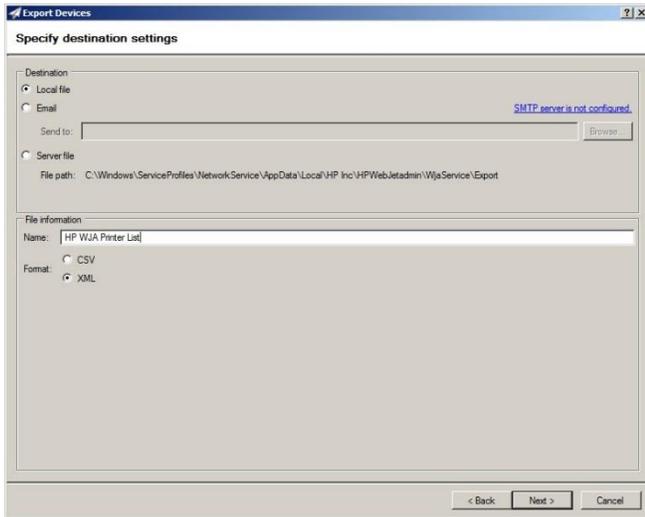


Figure 9-3 Specify Destination Settings

6. Enter a Name for the file (For example, HP WJA Printer List)

7. Select Local as the destination for the file

8. Select XML as the Format

9. Click Next

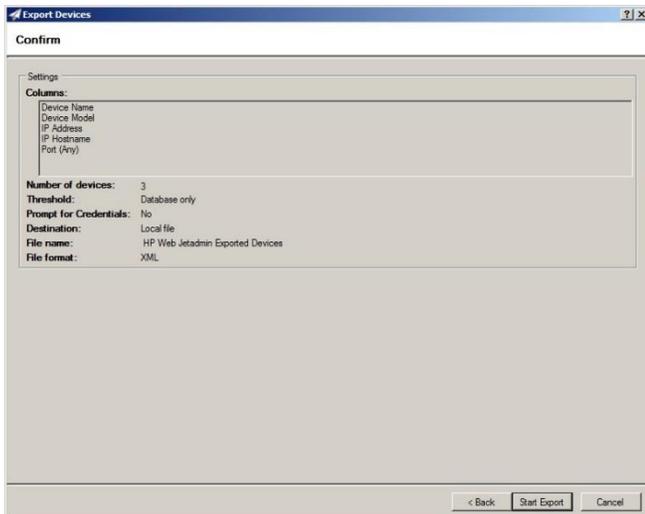


Figure 9-4 Confirm Settings

10. Click Start Export

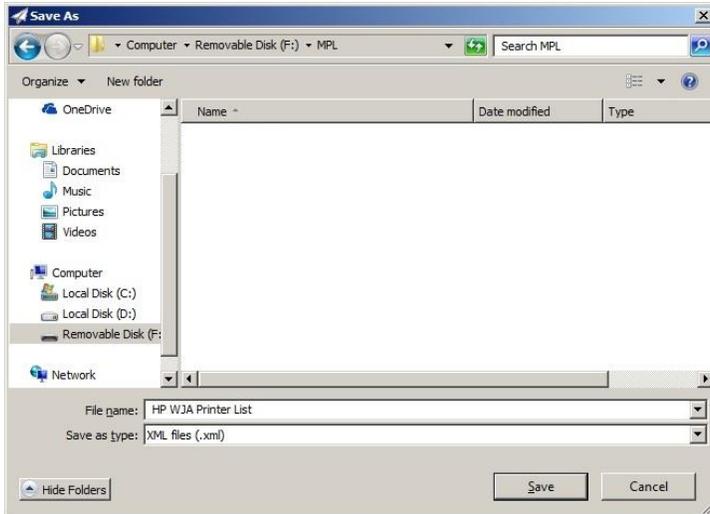


Figure 9-5 Save to File

11. Select the destination for the .xml file (For example, C:\MPL)
12. Enter the File name
13. Click Save

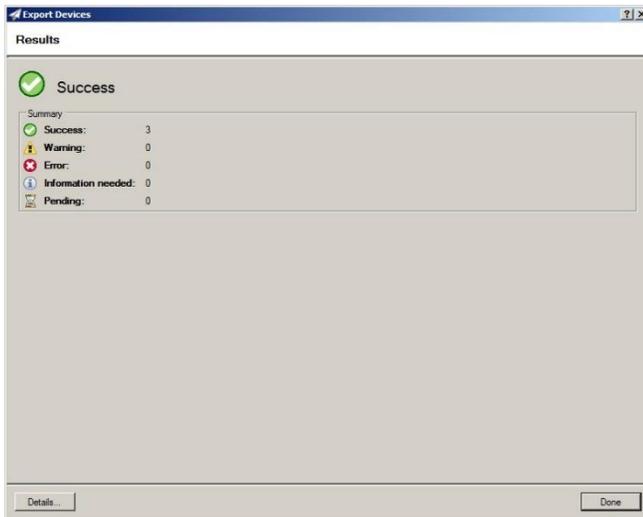


Figure 9-6 Export Results

14. Click Done

The Exported WJA Managed Printer List XML File Format

When exported from HP Web Jetadmin v10.4, the basic MPL XML file has the following format:

```
<?xml version="1.0"?>
- <Devices>
  - <Device>
    <DeviceName Title="DeviceName">HP Color LaserJet Flow MFP M680</DeviceName>
    <DisplayName Title="DisplayName">HP LaserJet flow MFP M525</DisplayName>
    <IPv4Address Title="IPv4Address">55.55.55.51</IPv4Address>
    <IPHostname Title="IPHostname">NPI555211</IPHostname>
    <PortDisplayString Title="PortDisplayString">1</PortDisplayString>
  </Device>
  - <Device>
    <DeviceName Title="DeviceName">HP Color LaserJet M553</DeviceName>
    <DisplayName Title="DisplayName">HP Color LaserJet M553</DisplayName>
    <IPv4Address Title="IPv4Address">55.55.55.52</IPv4Address>
    <IPHostname Title="IPHostname">NPI555281</IPHostname>
    <PortDisplayString Title="PortDisplayString">1</PortDisplayString>
  </Device>
  - <Device>
    <DeviceName Title="DeviceName">HP Color LaserJet flow MFP M880</DeviceName>
    <DisplayName Title="DisplayName">HP Color LaserJet flow MFP M880</DisplayName>
    <IPv4Address Title="IPv4Address">55.55.55.53</IPv4Address>
    <IPHostname Title="IPHostname">NPI555259</IPHostname>
    <PortDisplayString Title="PortDisplayString">1</PortDisplayString>
  </Device>
</Devices>
```

Figure 9-7 WJA MPL XML File Format

Implement Managed Printer Lists (MPLs) within the HP UPD Active Directory Administrator Template file

Printer lists for use in the Active Directory Group Policy environment are created outside the Active Directory Group Policy object, and linked to the HP UPD Active Directory Administrator template within each Group Policy Object. Create Managed Printer Lists by exporting printer lists from HP Web Jetadmin. For each policy created, up to 40 Managed Printer Lists can be selected.

- **Custom MPL Count.** This number must match the number of printer lists entered.
- **HP MPL Only.** Uncheck this.
- **Name.** This is the name displayed for each group.
- **Path.** The information in the **Path** field depends on the type of MPL and the location of the data.
- **Type.** Choose the correct type of printer list being selected.
 - **Web JetAdmin XML MPL** for printer lists exported by HP Web Jetadmin

Use the Active Directory Administrator Template

Use the following steps to distribute the mpl using the Microsoft Group Policy Editor:

NOTE: These steps assume you are currently using the HP AD Administrator template. For information on using the HP UPD Active Directory Administrator template, see the chapter “Managing the HP UPD with Active Directory Group Policy.”

1. With HP AD Templates installed, run the Microsoft Group Policy Editor (gpedit.msc)
2. From the left panel under **User Configuration**, expand the **Administrative Templates**

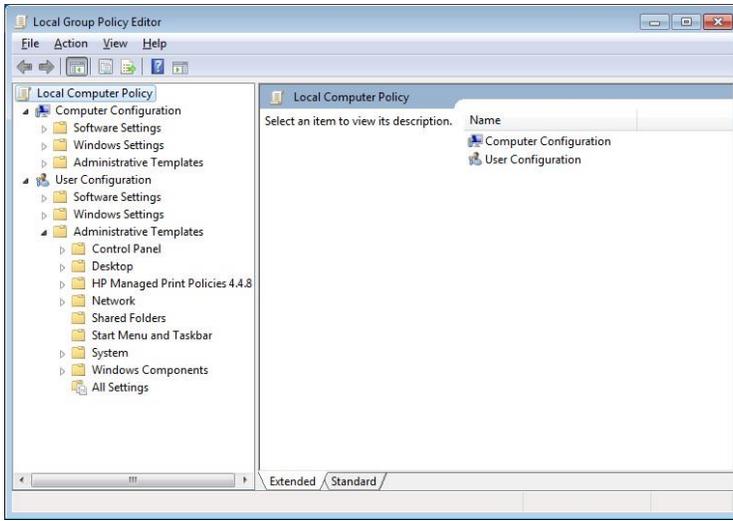


Figure 9-8 Managed Print Policies

3. Expand HP Managed Print Policies

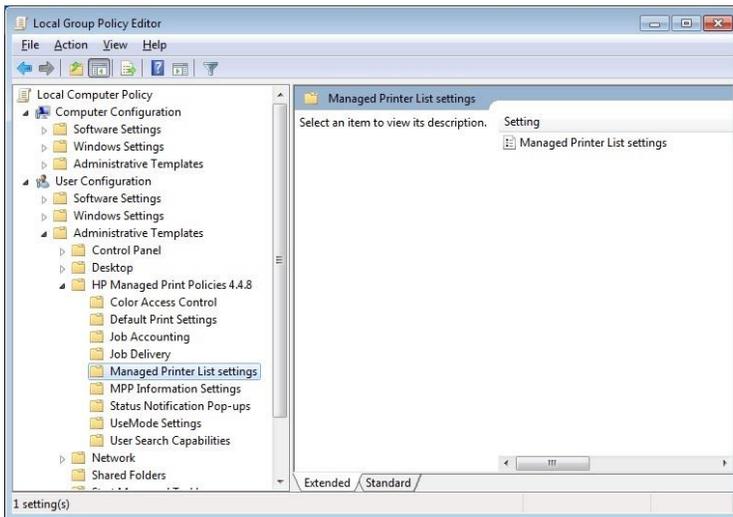


Figure 9-9 Managed Printer List Settings

4. Click **Managed Printer List settings**
5. On the right panel, double click **Managed Printer List Settings in** . The following screen is displayed:

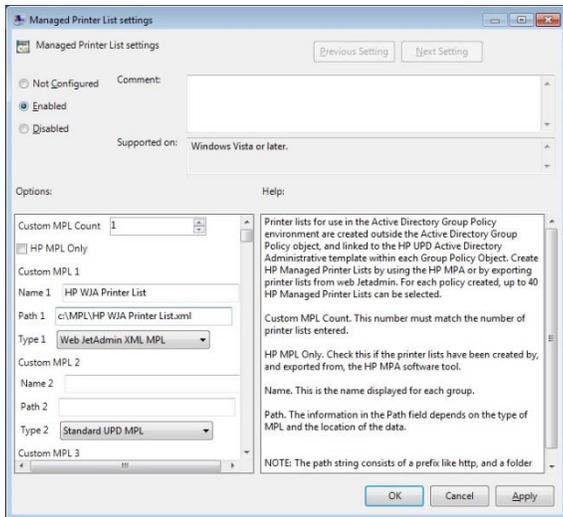


Figure 9-10 Managed Printer List settings

6. Click **Enabled**
7. Select one (1) for the **Custom MPL Count** field.
8. Uncheck **HP MPL Only**
9. Enter the name of the MPL to be displayed to the user in the **Name** field (for example, **HP WJA Printer List**)
10. Enter the path for the xml file in the **Path** field (for example, C:\MPL\HP WJA Printer List.xml)

NOTE: The path can be in the following formats: \\networkpath\printerlist.xml or c:\path\printerlist.xml

11. Select **Web JetAdmin XML MPL** for the **Type** field.
12. Click **Apply**
13. Click **OK** to exit

View results

The following HP UPD panels show the result of the entries.

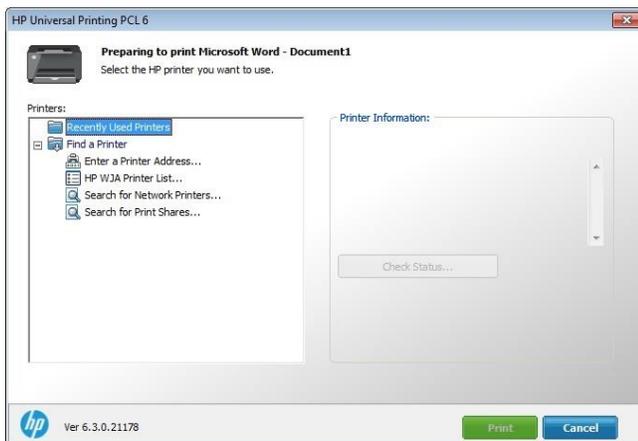


Figure 9-11 Dynamic mode UI

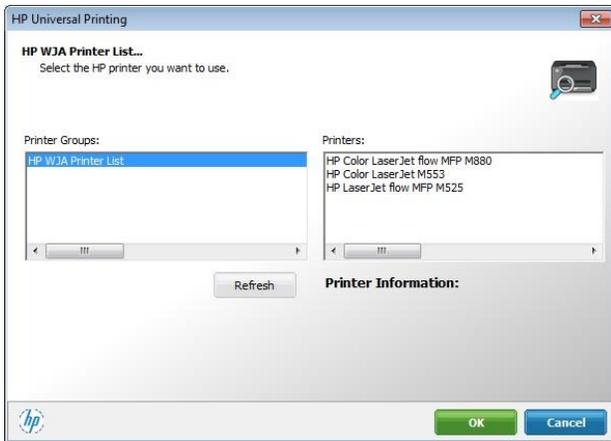


Figure 9-12 Managed Printer List

Implement Managed Printer Lists (MPLs) within the HP UPD using Install.exe

Use the following to have HP UPD read the Managed Printer List XML file from a shared or local directory. Before installing HP UPD, place the MPL XML file into a directory accessible from the HP UPD client host. Utilize HP UPD's command line switches to define the HP UPD to be installed in Dynamic mode, and define the location and filename of the MPL XML file. Two switches are required

/dm Installs the HP UPD in Dynamic Mode

/aml<"Name", "Path"> Adds a Managed List Name using the specified URL or UNC path.

Troubleshooting

Problem:

Printer list is empty.

Searching for and using Network Printers may be disabled in the Group Policy. Verify that Network Printers in User Search Capabilities Properties in the administrative template is checked.

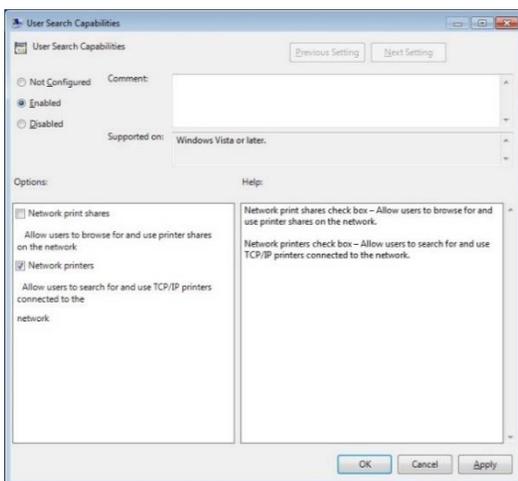


Figure 9-13 Troubleshooting

A HP UPD new features and OS support changes

Introduction

This chapter contains the following sections about new features in various HP UPD releases.

- [New Features in HP UPD v6.5.0](#)
- [New Features in HP UPD v6.4.1](#)
- [New Features in HP UPD v6.3.0](#)
- [New Features in HP UPD v6.2.1](#)
- [New Features in HP UPD v6.1.0](#)
- [New features in HP UPD v6.0.0](#)
- [New features in HP UPD v5.9.0](#)
- [New features in HP UPD v5.8.0](#)
- [New features in HP UPD v5.7.0](#)
- [New features in HP UPD v5.6.5](#)
- [New features in HP UPD v5.6.0](#)
- [New features in HP UPD v5.4](#)

NOTE: For the latest information on new releases of the HP UPD, see the release notes with the print drivers on www.hp.com/go/upd.

New Features in HP UPD 6.5.0

HP PARK tools support changes

DCU 1.650.1.32821

- Add support for Color Settings for Capabilities mode
- Print Quality Support for Ink devices through Capabilities mode
- Remove support for Status Notification Pop-ups (SNPs)
- Mopier Mode, Job Storage and Storage Device settings now set to Not Configured so that if set to Installed, these settings are set in the registry.
 - In the past, Mopier Mode, Job Storage and Storage Device defaulted to Installed.
 - Since they did not change if left to Installed, the cfm file from DCU did not set these settings.
 - If not pointing at an actual device with Bidi enabled, settings such as Mopier would be disabled.

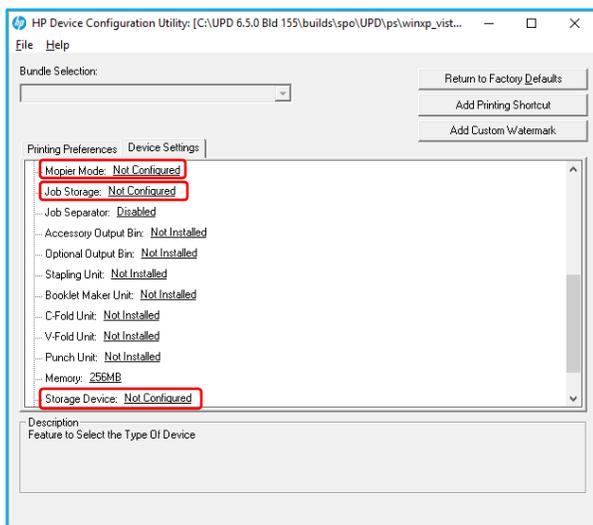


Figure A-1 DCU settings

AD Template 4.5.0

- Remove support for Status Notification Pop-ups (SNPs)

New HP UPD Features

- Added support for new products introducing in the second half of 2017
- Expanded support for Capabilities mode including Paper Sizes, Color and Ink Settings, Ink Print Quality Settings, and Secure Encryption
- HP UPD implementation of Compatible IDs
 - A Compatible ID is a vendor-defined identification string that Windows uses to match a device to an INF file if a HW ID is not available.
 - A device can have associated with it a list of Compatible IDs, such as Laser, Ink, MFP, Color, etc.
- Expanded support for “new” printers in future releases supporting Capabilities mode
- Edge to edge support in compatibilities mode for printers supporting edge-to-edge
 - Select this option to print a document with 2 mm margins on supported devices. If this option is not selected, the document will be printed with standard margins.
 - This feature is auto configurable in the Printer Properties Device Settings tab. By default it is set to automatic.

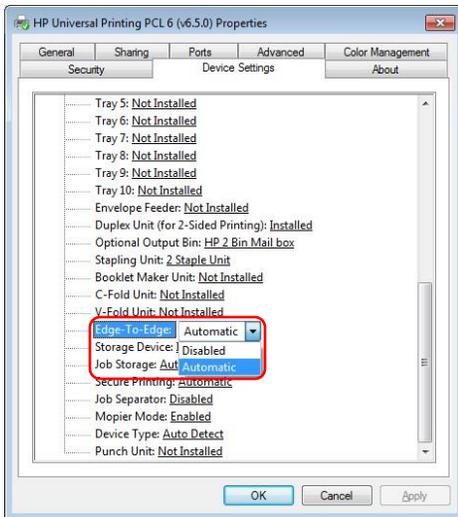


Figure A-2 Edge-to-edge settings on the Device Settings tab

NOTE: Edge-To-Edge is only supported on printers that support both Edge-To-Edge and Capabilities mode.

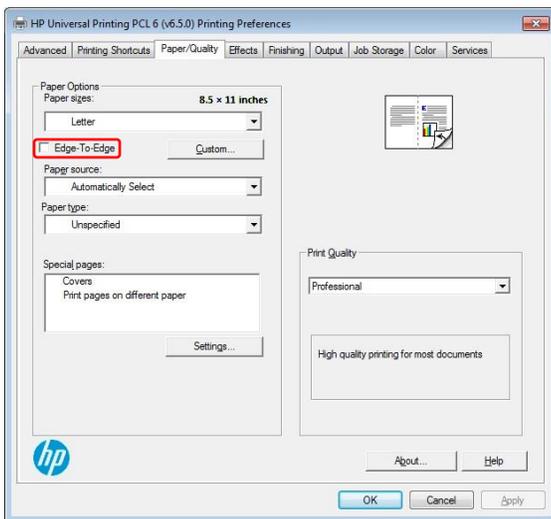


Figure A-3 Edge-to-edge setting on the Print Quality tab

HP UPD 6.5.0 with version 4.5 firmware and Capabilities mode

Up until recently, the HP UPD would query the printer and the printer would return device information about the printer such as the model number of the printer and the model number of input and output devices, as well as other accessories. The driver would then map the device information to settings in the driver. Starting with HP UPD 6.4.1 and the HP LaserJet MFP E725xx, E825xx, E778xx and E876xx printers releasing in spring 2017, the printer returns the capabilities of the device to the print driver versus the device information.

One way to think of this is to look at it as two modes, Capabilities mode and Device mode, to differentiate between how releases of the firmware and HP UPD communicate device features. Device mode is how prior releases of the firmware shared device information with HP UPD such as printer part numbers and model numbers with the HP UPD mapping the device information to settings in the driver. Capabilities mode, which was introduced in HP UPD 6.4.1 and the HP LaserJet MFP E725xx, E825xx, E778xx and E876xx printers, enables firmware on supported devices to share the capabilities of the device and input/output devices with the HP UPD to configure settings directly in the HP UPD.

NOTE: Whether the firmware and driver use Device mode versus Capabilities mode is dependent on the printer firmware and version of the HP UPD. If Capabilities mode is supported by the firmware, HP UPD 6.4.1 and later will use Capabilities mode to configure the driver. To verify which mode is supported, open the Device Settings tab in Printer Properties and see whether **Accessory Output Bin** or **Optional Output Bin** is listed. If **Accessory Output Bin** is displayed, the driver is using Device mode. If **Optional Output Bin** is displayed, the driver is using Capabilities mode.

By standardizing the capabilities, the Capabilities mode sends the capabilities of the printer and input/output devices, reducing the dependency on Hardware IDs.

If Capabilities mode is not available, device information is shared between firmware and the HP UPD, and the HP UPD maps the device information to capabilities or settings in the HP UPD. If Capabilities mode is available, the capabilities information is shared between firmware and the HP UPD without the need to map device information to settings.

NOTE: With Bidi disabled (such as SNMP disabled), or not pointing at an actual device, even with HP UPD 6.5.0 or later, and printer Capabilities mode, the print queue has no way to determine the type of device or available features. With Bidi disabled (and/or not pointing at an actual device) using DCU or a reference device to configure the queue, the print queue only knows the features based on the DCU settings or reference device connected originally. The queue has no way of knowing which product or type of product it is actually printing to.

NOTE: AD templates, DCU and DDU are designed for the HP V3 UPD such as HP UPD 6.5.0 and do not support newer discrete (printer specific) drivers for Windows 7 and later operating systems.

Capabilities mode added to older products

With the release of FutureSmart Firmware Bundle Version 4.5, Capabilities mode has been added to the following printers.

Table A-1 Printers with Capabilities added with new releases of firmware

HP Printer	HP Managed Printer
HP LaserJet Enterprise M506x (graphical display only)	HP LaserJet Managed M506x (graphical display only)
HP Color LaserJet Enterprise M553x (graphical display only)	HP Color LaserJet Managed M553x (graphical display only)
HP OfficeJet Enterprise Color X555	
HP OfficeJet Enterprise Color MFP X585	
HP PageWide Enterprise Color MFP 586	HP PageWide Managed Color MFP E58650
HP PageWide Enterprise Color 556	HP PageWide Managed Color E55650
HP LaserJet Enterprise M605x, M605xm, M606x (graphical display only)	
HP LaserJet Enterprise M607/M608/M609	HP LaserJet Managed E60055/E60065/E60075
HP Color LaserJet Enterprise M651	HP Color LaserJet Managed M651
HP Color LaserJet Enterprise M652/M653	HP Color LaserJet Managed E65050/E65060
HP LaserJet Enterprise M806	
HP Color LaserJet Enterprise M855	
HP LaserJet Enterprise 500 MFP M525*	HP LaserJet Managed MFP M525*

HP Printer	HP Managed Printer
HP LaserJet Enterprise MFP M527*	HP LaserJet Managed MFP M527*
HP LaserJet Enterprise 500 Color MFP M575*	HP Color LaserJet Managed MFP M575*
HP Color LaserJet Enterprise MFP M577*	HP Color LaserJet Managed MFP M577*
HP LaserJet Enterprise MFP M630*	HP LaserJet Managed MFP M630*
HP LaserJet Enterprise MFP M631/M632/M633	HP LaserJet Managed MFP E62555/E62565/E62575
HP Color LaserJet Enterprise MFP M680*	HP Color LaserJet Managed MFP M680*
HP Color LaserJet Enterprise MFP M681/M682	HP Color LaserJet Managed MFP E67550/E67560
HP LaserJet Enterprise MFP M725*	HP LaserJet Managed MFP 725*
HP LaserJet Enterprise 700 Color MFP M775*	HP Color LaserJet Managed MFP M775*
HP LaserJet Enterprise Flow MFP M830*	HP LaserJet Managed MFP M830*
HP Color LaserJet Enterprise Flow MFP M880*	HP Color LaserJet Managed MFP M880*

* Support for Capabilities mode added in FutureSmart Firmware Bundle Version 4.4

Differences in the Control Panel U/I

Upgrading firmware to support Capabilities mode updates the Control Panel U/I on products running firmware prior to version 4.

For more information on the new control panel user interface see, <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA6-9365ENW>

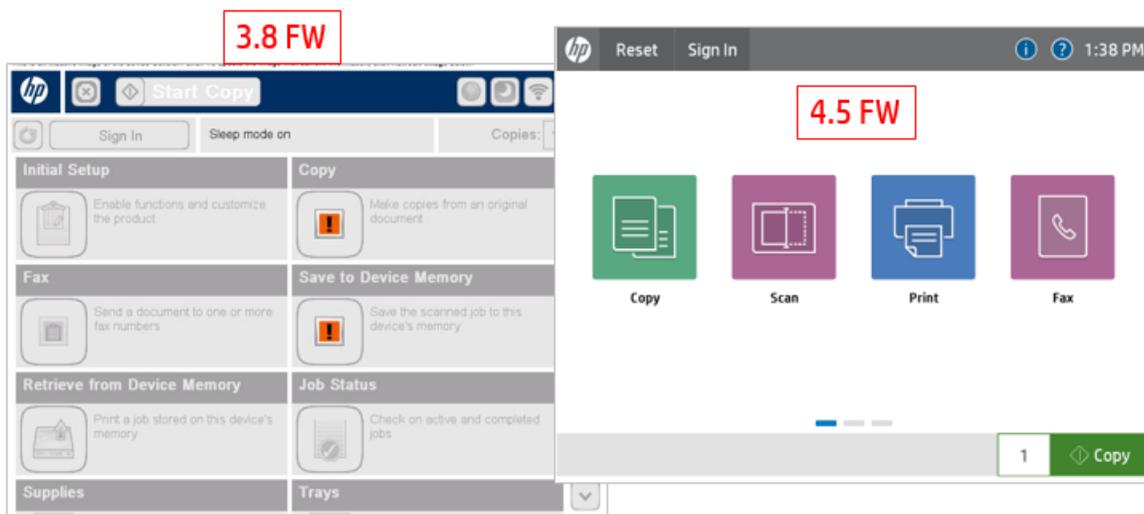


Figure A-4 Comparison of Control Panel U/I

Changes to the Device Settings tab

- With version 4.5 firmware, **Accessory Output Bin** is replaced with **Optional Output Bin**, listing the type of bin instead of the model number.
- Additional functions are added to select the type of stapling and punch unit installed and whether a booklet maker, c-fold, or v-fold unit is installed.

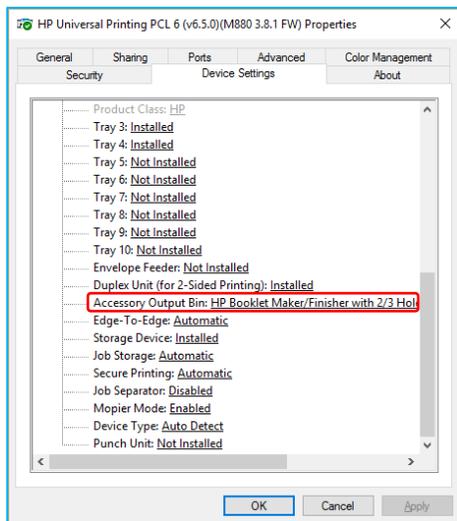


Figure A-5 Device Settings for M880 with 3.8.1 firmware

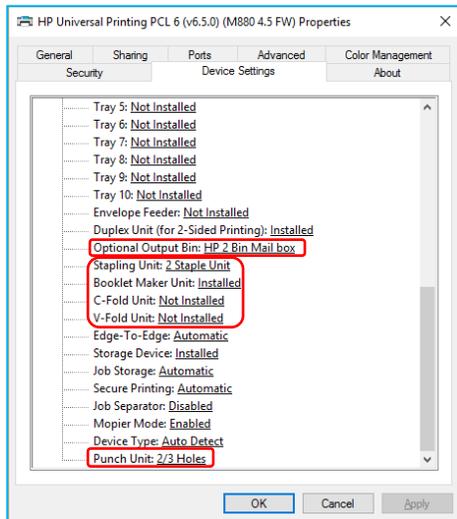


Figure A-6 Device Settings for M880 with 4.5 firmware

Changes to the Print Quality Settings

- Updated print quality settings to be more consistent across new product families
- Gloss Level settings are no longer available with Capabilities mode

Table A-2 New Print Quality Settings for HP Laser-Based Products

HP Laser Print Quality Setting	Description
Normal (default)	<ul style="list-style-type: none"> • (Color) High quality printing for most documents with ImageREt • (Mono) High quality printing for most documents with FastRes
Enhanced	<ul style="list-style-type: none"> • (Color Only) Enhanced quality for photos, presentations and brochures
Fine Lines	<ul style="list-style-type: none"> • (Color/Mono) 1200x1200 for line art, architectural drawings, finger prints
Quick View	<ul style="list-style-type: none"> • (Color/Mono) Fast preview of documents, lower resolution
Economode	<ul style="list-style-type: none"> • (Color/Mono) Lowest cost printing, lowest resolution

Table A-3 Print Quality Settings for HP Ink-Based Products

HP Ink Print Quality Setting *	Description (Color Printers)
Professional	<ul style="list-style-type: none"> • High quality printing for most documents
Presentation	<ul style="list-style-type: none"> • Enhanced quality for presentations and brochures
Maximum dpi	<ul style="list-style-type: none"> • Slower print with premium quality intended for photo media
General Office	<ul style="list-style-type: none"> • Fastest print speed at lower resolutions

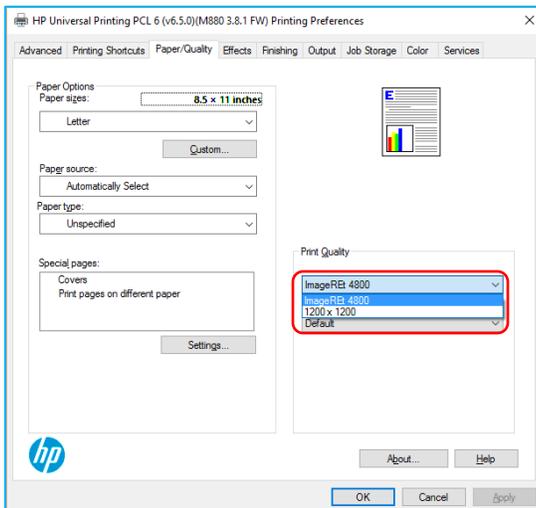


Figure A-7 Print Quality settings for M880 with 3.8.1 firmware

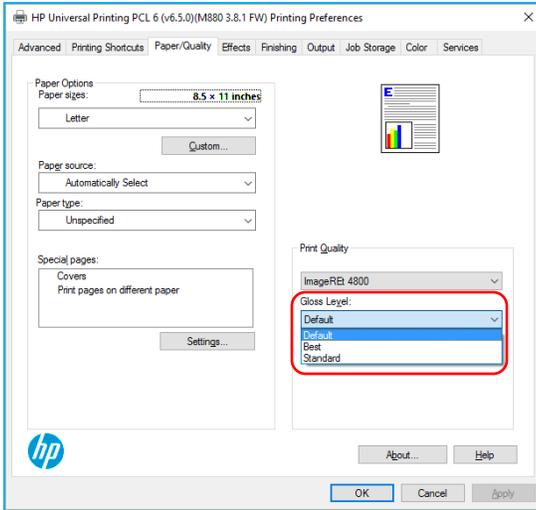


Figure A-8 Print Quality settings for M880 with 3.8.1 firmware

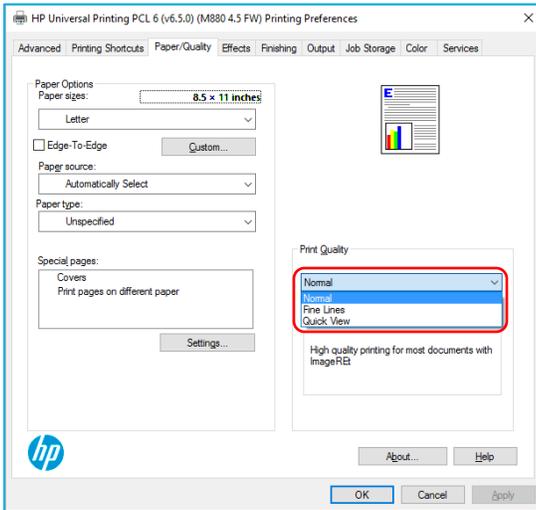


Figure A-9 Print Quality settings for M880 with 4.5 firmware

Changes to the Output tab settings

- The Booklet Maker bin is no longer listed under Output Bin Options. Select Fold and Stitch under the Staple options to select the Booklet Maker.

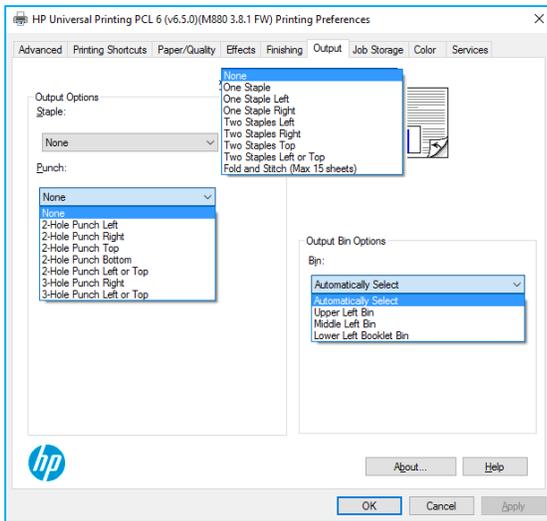


Figure A-10 Output tab for M880 with 3.8.1 firmware

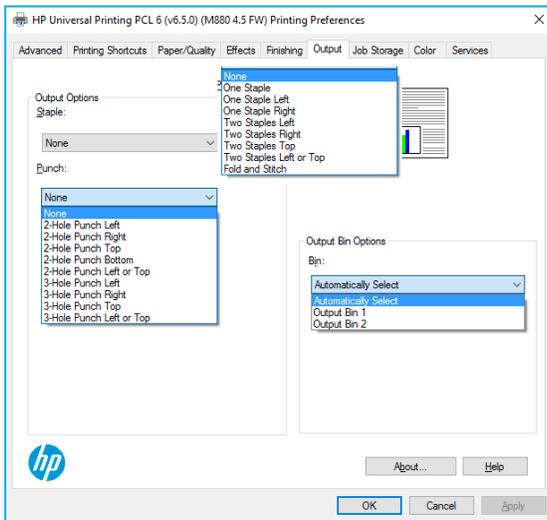


Figure A-11 Output tab for M880 with 4.5 firmware

Fast Booklet mode on HP MFP S900 printers

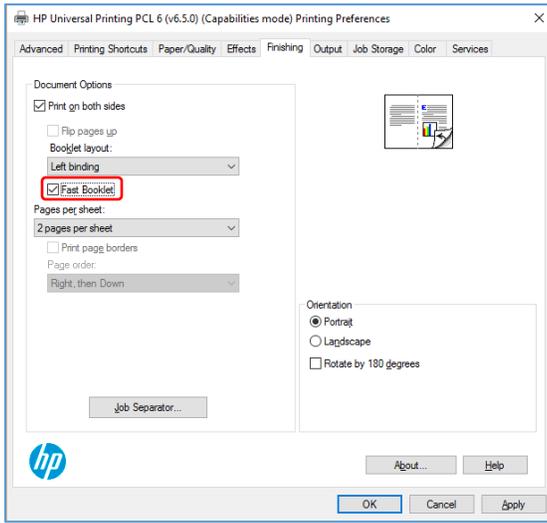


Figure A-12 Fast Booklet mode on HP MFP S900 printers

Fast Booklet mode is only available on HP MFP S900 printers. For some documents, this may increase performance when printing booklets.

NOTE: Fast Booklet mode is an additional mode to the standard way for printing booklets.

To print a booklet on 11x17 media using Fast Booklet mode, perform the following steps:

1. Select **File** and then **Print** in the application
2. Click **Properties**
3. Click the **Finishing** tab
4. Select **Print on both sides**
5. Select the **Booklet Layout** (such as Left Binding)
6. Select **Fast Booklet**
7. Select **2 pages per sheet**
8. Click the **Output** tab
9. Select **Fold and Stitch** under the Stapling options
10. Click the **Paper/Quality** tab
11. Select the input tray that has 11x17 or A3 paper
12. Click **OK** and then click **Print**

Deprecated Features

Status Notification Pop-ups (SNP) are no longer available starting with the release of HP UPD 6.5.0. HP UPD v6.4.1 is the last release of the HP UPD supporting Status Notification Pop-ups (SNPs).

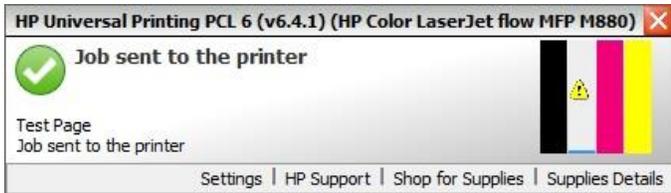


Figure A-13 Status Notification Pop-up

NOTE: On HP UPD v4.7 through UPD v6.4.1, SNP can be enabled or disabled from the Device Settings tab of the driver. Before HP UPD v4.7, SNP could only be disabled from the SNP dialog box.

New Features in HP UPD v6.4.1

OS support changes

Removed: Support for Windows Server 2008 x32 and x64 (does not impact Windows Server 2008R2)

Added: Support for Microsoft Windows Server 2016 for PCL 6 and PS

HP PARK tools support changes

Removed: Support for HP Managed Print Administrator (MPA)

New Features

- Added support for new products introducing in the first half of 2017
- Print Quality Settings
- Output Device Settings
- Group Watermarks
- Changes for Black Only or High Quality CMYK Grayscale dropdown

NOTE: UPD 6.4.1 requires a minimum of SP1 on Windows 7 and Server 2008R2.

Print Quality Settings

With the release of HP UPD 6.4.1, the naming for print quality settings have been updated for most products releasing in the first half of 2017 and later as shown in the following tables.

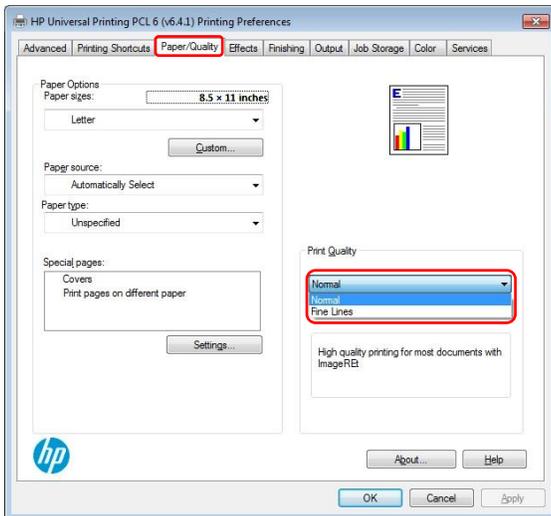


Figure A-14 HP UPD 6.4.1 Print Quality Settings for New Products

Table A-4 HP UPD 6.4.1 Print Quality Settings for New HP Laser-Based Products

HP Laser Print Quality Setting *	Description
Normal (default)	<ul style="list-style-type: none"> (Color) High quality printing for most documents with ImageREt (Mono) High quality printing for most documents with FastRes
Enhanced	<ul style="list-style-type: none"> (Color Only) Enhanced quality for photos, presentations and brochures
Fine Lines	<ul style="list-style-type: none"> (Color/Mono) 1200x1200 for line art, architectural drawings, finger prints
Quick View	<ul style="list-style-type: none"> (Color/Mono) Fast preview of documents, lower resolution
Economode	<ul style="list-style-type: none"> (Color/Mono) Lowest cost printing, lowest resolution

* New settings for products releasing the first half of 2017 and later. Specific settings may not be available on all products.

Table A-5 HP UPD 6.4.1 Print Quality Settings for HP Ink-Based Products

HP Ink Print Quality Setting *	Description (Color Printers)
Professional	<ul style="list-style-type: none"> High quality printing for most documents
Presentation	<ul style="list-style-type: none"> Enhanced quality for presentations and brochures
Maximum dpi	<ul style="list-style-type: none"> Slower print with premium quality intended for photo media
General Office	<ul style="list-style-type: none"> Fastest print speed at lower resolutions

* Specific settings may not be available on all products.

Output Device Settings

With HP UPD 6.4.1 and later, on most HP LaserJet printers introduced in the first half of 2017 and later, **Accessory Output Bin** is replaced with **Optional Output Bin**, listing the type of bin instead of the model number. Additional functions are added to the list including stapling unit, booklet maker, etc. See the following table for more information.

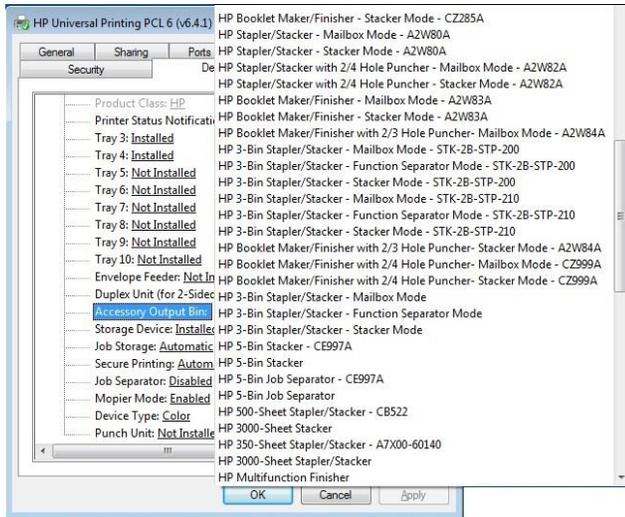


Figure A-15 Accessory Output Bin Options on Legacy Printers

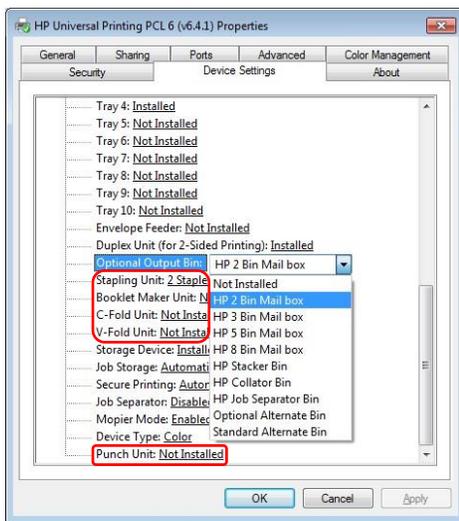


Figure A-16 HP UPD 6.4.1 Output Devices Selected by Features versus Model Number on New Printers

Table A-6 HP UPD 6.4.1 Output Devices Selected by Features versus Model Number on New Printers

Feature	Available Settings*
Optional Output Bin	<p>With HP UPD 6.4.1 and later, on most HP LaserJet printers introduced in the first half of 2017 and later, Accessory Output Bin is replaced with Optional Output Bin, listing the type of bin instead of the model number.</p> <ul style="list-style-type: none"> • Not Installed • HP 2 Bin Mail box • HP 3 Bin Mail box • HP 5 Bin Mail box • HP 8 Bin Mail box • HP Stacker Bin • HP Collator Bin • HP Job Separation Bin • Optional Alternate Bin
Stapling Unit	<p>Specifies whether an optional stapling unit is installed on the product including the type of stapling unit.</p> <ul style="list-style-type: none"> • Not Installed • 1 Staple Unit • 2 Staple Unit • 3 Staple Unit
Booklet Maker Unit	<p>Specifies whether an optional booklet maker is installed on the product.</p> <ul style="list-style-type: none"> • Not Installed • Installed
C-Fold Unit	<p>Specifies whether an optional C-fold unit is installed on the product.</p> <ul style="list-style-type: none"> • Not Installed • Installed <p>C-fold (Tri-fold) uses two folds with the sheet folded into three nearly equal sections, with one panel serving as a cover, creating six panels for printed content. Often used for self-mailing brochures or pamphlets, letters, statements, invoices, bulletins, any letter size sheet (8.5" x 11") requiring insertion into a standard #10 or #9 envelope.</p>
V-Fold Unit	<p>Specifies whether an optional V-fold unit is installed on the product.</p> <ul style="list-style-type: none"> • Not Installed • Installed <p>For V-fold (Bi-fold), the sheet is folded into two equal sections with a single fold, creating four separate panels or pages to be printed on. Often used for Bulletins, menus, programs, greeting cards, technical instructions, booklet pages.</p>
Punch Unit	<p>Specifies whether an optional punch unit is installed on the product including the type of punch unit.</p> <ul style="list-style-type: none"> • Not Installed • 2/3 Holes • 2/4 Holes • 4 Holes-Swedish

* Available settings will vary depending on the printer and optional output device

Group Watermarks

HP UPD 6.4.1 added a new watermark feature called **Group Watermarks** under the Edit Watermark options as shown below. This feature enables you to combine multiple dynamic watermarks together and position them to the **Top Right** or **Center** of the page.

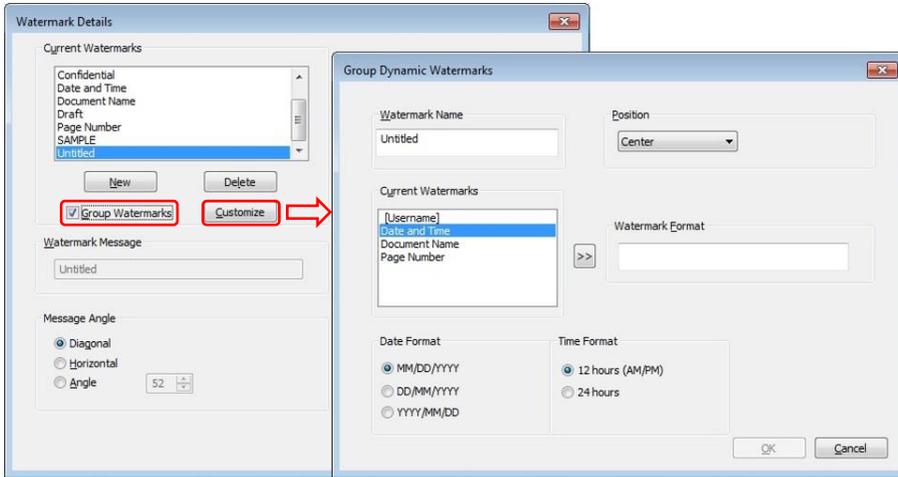


Figure A-17 Group Dynamic Watermarks dialog box

Changes for Black Only or High Quality CMYK Grayscale dropdown

- For ink-based printers, HP UPD 6.4.1 decoupled the dropdown to select **Black Only** or **High Quality CMYK Grayscale** and **HP EasyColor** on the **Color** tab
 - Dropdown settings can now be selected when **Print in Grayscale** and **HP EasyColor** is selected.
- **Black Ink Only** was changed to **Black Only**
- **High Quality** was changed to **High Quality CMYK Grayscale**
- This dropdown has also been added to most HP LaserJet printers introducing in the first half of 2017 and later

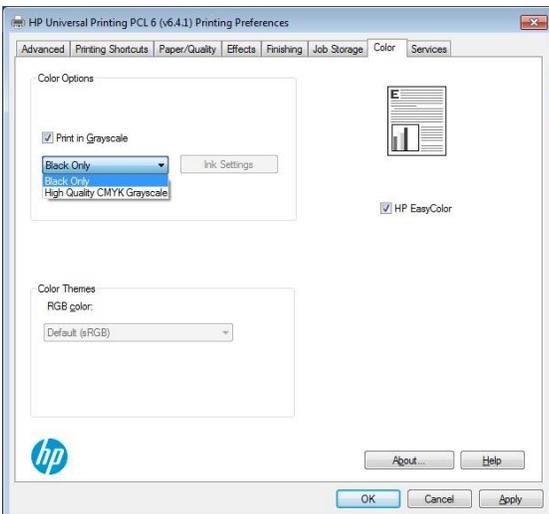


Figure A-18 PCL 6 (Ink) Color Tab with Print in Grayscale and HP Easy Color selected

New features in HP UPD v6.3.0

New Features

- Includes PCL 6 and PS page description languages
- Added support for new products introducing in Fall 2016
- Added Print in Grayscale (Black Ink Only) for PS
- Decoupled Print in Grayscale and HP EasyColor so that **Print in Grayscale** can be selected when **HP EasyColor** is selected.

NOTE: UPD 6.3.0 requires a minimum of SP1 on Windows 7 and Server 2008R2.

New features in HP UPD v6.2.1

New Features

- Includes PCL 6 and PS page description languages
- Added support for new products introducing in Spring 2016

NOTE: UPD 6.2.1 requires a minimum of SP1 on Windows 7 and Server 2008R2.

New features in HP UPD v6.2.0

PDL support change

Removed: Support for PCL 5

NOTE: HP UPD v6.1.0 is the last version of the UPD to support PCL 5. PCL 5 is not supported on Windows 10

New Features

- Includes PCL 6 and PS page description languages
- Added support for new products introducing in Spring 2016
- Added support for XenApp 7.6 UPS
- Added support for Dynamic Watermarks - Document Name and Page Numbers
- Added support for a watermark image having near white pixels printing - PCL6 ONLY
- Updated Hewlett-Packard references for new company
- New signing process

NOTE: UPD 6.2.0 requires a minimum of SP1 on Windows 7 and Server 2008R2.

New features in HP UPD v6.1.0

OS support change

Removed: Support for Windows XP and Windows Vista

Added: Support for Microsoft Windows 10 for PCL 6 and PS

NOTE: PCL 5 is not supported on Windows 10

New Features

- Includes PCL 6, PCL 5 and PS page description languages
- Added support for new products introducing in Fall 2015
- Added option to lock paper sizes in DCU
- Added support for HP Ink-based products for Grayscale Options (Black Ink Only, High Quality) in UPD PCL6

New features in HP UPD v6.0.0

OS support change

Removed: Support for Windows Server 2003 / 2003 R2

New Features

- Added support for new products introducing in Spring 2015
- Added support for the separator page on the HP MFP S900 printers
- Includes PCL 6 and PS page description languages, available in both 32-bit and 64-bit packages
 - HP UPD PCL 5 driver is not part of this release and is only updated once a year
- Added support for using printui.dll switches /Ss and /Sr
- Added support for Citrix XenApp and XenDesktop v7.5
- Added support for Internet Printing Protocol for Traditional Mode Print Queues
 - HP UPD Dynamic mode is not supported
 - HP UPD uses SNMP to communicate device status and capabilities to the printer driver
 - IPP does not support SNMP, therefore HP UPD's bidirectional communication (Update Now feature) is not supported for IPP connected printers
 - HP recommends utilizing the HP Driver Configuration Utility to define the print device features for use with the HP UPD
- When using install.exe /SM and specifying an LPT port, the port name must be in all capital letters and contain a colon (i.e. LPT1:)
 - Lower-case port names without a colon are no longer valid resulting in failure to create the port or creation of a port name not tied to the system's LPT port.

New features in HP UPD v5.9.0

New Features

- Includes PCL 5, PCL 6 and PS page description languages, available in both 32-bit and 64-bit packages
- Added support for new products introducing in Spring 2014
- New graphics displayed on the UPD installer and Automatic Configuration screens
- New Separator Page (Alternate)
 - Prints one separator page for the entire print job
 - Not available on Windows XP, Windows Vista or Windows Server 2003
- Change CMYK Color default setting to "SWOP" for PS only
- Add ability to LOCK Watermark setting in DCU
- Install.exe help contents updated to communicate that /q and /h are required switches when used with /infstage and /infremove
- Improved error messaging when HP UPD fails to "Add Permanent instance printer..." in dynamic mode.
- Services tab now supports Mozilla and Chrome browsers

NOTE: HP UPD v5.9.0 is the last version of the HP UPD PCL5 to support Microsoft Windows XP and Vista.

New features in HP UPD v5.8.0

New Features

- Includes PCL 6 and PS page description languages, available in both 32-bit and 64-bit packages
 - HP UPD PCL 5 driver is not part of this release and is only updated once a year
- Added support for new products introducing in Fall 2013
- Added Install.exe help contents to communicate that /q and /h are required switches when used with /infstage and /infremove
- Support for the HP MFP S900 series printers

New features in HP UPD v5.7.0

New Features

- Includes PCL 5, PCL 6 and PS page description languages, available in both 32-bit and 64-bit packages
- Added support for new products introducing in Fall 2014

New features in HP UPD v5.6.5

PDL Change

NOTE: UPD v5.6.0 and UPD v5.6.5 do not contain an HP UPD PCL 5 release.

Beginning with UPD v5.5.0, PCL 5 began a yearly update release cycle, therefore the most current version of HP UPD PCL 5 may not match the version number release for UPD PCL 6 and PS. The most current HP UPD PCL 5 version is available on www.hp.com/go/upd.

The HP UPD PCL 5 driver is only updated once a year and may not include support for the latest features and devices.

New Features

- Added support for new products introducing in Fall 2014
- Driver Versioning
- New HP UPD Installer

Driver Versioning

Starting with HP UPD v5.5.0, the driver supports a major.minor.subminor release version.

As with previous versions of UPD, two driver name options will be offered during installation.

- Default driver name: HP Universal Printing PCL 6
- Versioned driver name : HP Universal Printing PCL 6 (v5.5.0)

With this change, you can install an HP UPD 5.6.5 driver and an HP UPD 5.6.0 driver on the same server

For UPD 5.4 and previous releases, a customer will not benefit from this change.

NOTE: You cannot install a 5.2.5 driver and 5.2.6 driver on the same server, since these are the same major.minor release version (5.2) and major.minor.subminor is not supported until UPD 5.5.0.

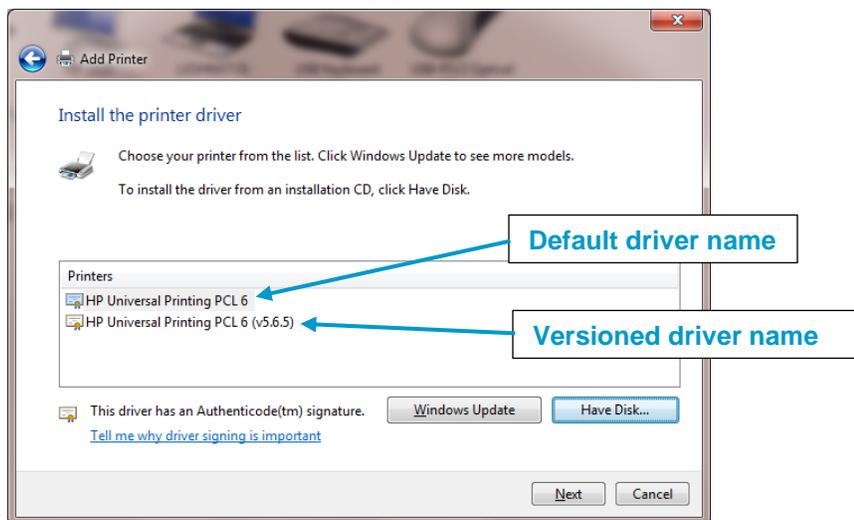


Figure A-19 Driver Versioning

New HP UPD Installer

Starting with UPD 5.6.5, new options in install.exe for Windows Vista and later Windows operating systems add the ability to select USB mode for USB Plug and Play with options to remove all versions of HP Universal Printing Driver from Windows driver store, or to add the HP Universal Printing Driver to Windows driver store.

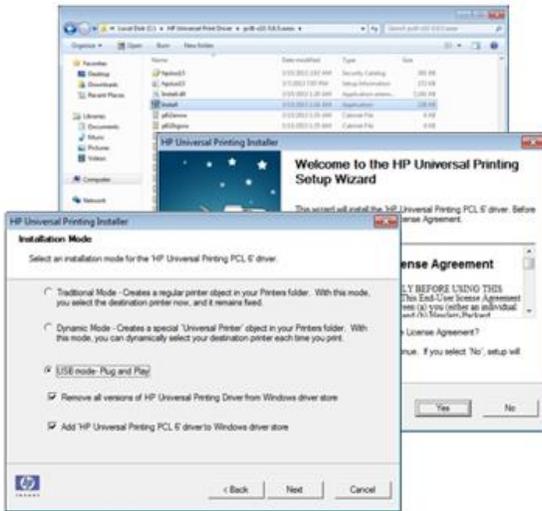


Figure A-20 USB Plug and Play options

NOTE: These settings only impact the Windows driver store. No HP UPD printer is installed, no printer driver is removed and no existing print queues are impacted. Only the HP UPD is added to the driver store. No non-HP UPD drivers are impacted.

For more information, see [USB connectivity](#).

New features in HP UPD v5.6.0

OS support change

Added: Support for Windows 8/8.1 and Windows Server 2012/2012R2

NOTE: UPD Dynamic Mode printing and Job Storage PIN and Encryption are only supported for desktop applications.

New Features

- Added support for new products
- New driver initialization
- Policy settings enforced for printing defaults
- USB DOT4 driver for Windows 8/8.1 and Windows Server 2012/2012R2

New driver initialization

New driver initialization routine to prevent interactive services detection (Session 0) messages.

Policy settings enforced for printing defaults

MPA, HP UPD AD template, or client side XML policy settings are enforced for printing defaults, and can only be overridden on a per-job basis.

NOTE: The locked policy settings may not be changed at any time by users.

USB DOT4 driver for Windows 8/8.1 and Windows Server 2012/2012R2

Support for USB DOT4 Direct Connect is not included in Windows 8/8.1 and Windows Server 2012/2012R2 by default. This only impacts DOT4 printers, which include most current HP mid-range and high-end HP LaserJet printers. Composite USB and LEDM USB printers are not impacted (low-end HP LaserJet printers).

NOTE: DOT4 and LEDM are communication protocols used with USB connected printers. DOT4 support is available by default on Windows operating systems prior to Windows 8/8.1 and Windows Server 2012/2012R2, such as Windows 7.

To resolve this issue, HP has developed the “HP LaserJet USB (DOT4) communications driver for Windows 8/8.1 and Server 2012/2012R2” which includes a Dot4x32.msi for 32 bit and Dot4x64.msi for 64 bit installations.

The MSI installs the DOT4 components into the driver store. This is the same effect as downloading it from Windows Update except that it is installed before the hardware is connected. The directory c:\windows\inf\driverstore lists an oemXX directory that contains the DOT4 components.

NOTE: If two print queues are created for the printer during plug and play and a print queue is connected to USB001, delete this queue. If there are two queues for the printer and both are connected to the DOT4 port, delete one of the queues. Only one queue is required for printing.

The HP LaserJet USB (DOT4) communications driver for Windows 8/8.1 and Server 2012/2012R2 is available through Windows Update. If the customer has automatic updates enabled, it will be downloaded when a DOT4 printer is installed. HP recommends downloading the latest driver from www.hp.com so the customer has the latest fixes and updates.

1. In the Windows 8/8.1 default user interface, click Desktop. Server 2012/2012R2 should boot up to the desktop.
2. Open your internet browser and go to www.hp.com.
3. Click **Support & Drivers** at the top of the screen.

4. Click **Drivers and Software**.
5. Type your product name and model number in the **Enter a product name/number** search box and then click the **Search** button or press **Enter**.
6. Scroll down and click your printer, multifunction printer, or all-in-one model from the search results.
7. Select your language from the **Choose your software/driver language:** drop-down list.
8. Select your operating system including x32 or x64 (such as Windows 8/8.1 (32-bit)).
9. Locate the “HP LaserJet USB (DOT4) communications driver for Windows 8/8.1 and Server 2012/2012R2” file and then click the **Download** button.

NOTE: The HP Dot4.msi only supports HP printers.

10. Click the **Save** button.
11. Go to the location where you downloaded the file and click **Run** or double click the Dot4x32.msi for 32 bit or Dot4x64.msi for 64 bit installations, and then wait for the process to finish.

NOTE: You only need to install the HP DOT4.msi on each system one time. The only time you need to reinstall it is if you remove it from your system or need to install a newer version.

New features in HP UPD v5.4

New Features

- Added support for new products
- Automatic Configuration Disabled status
- Request for PIN print for every new print job

Automatic Configuration Disabled status

The status **Automatic Configuration Disabled** displays on the driver Properties **Status-About** tab when the driver installation default **Print Auto-Configuration** is set to **Disabled** using the HP Driver Configuration Utility or the HP Driver Deployment Utility.

Request for PIN print for every new print job

Request PIN print for every new print job when driver installation default **Request PIN (while printing)** is set using the HP Driver Configuration Utility or the HP Driver Deployment Utility.

B Known issues

The following sections provide information and steps for resolving known issues in the HP UPD.

- [High resolution TIFF files not printing correctly with HP UPD PCL 6](#)
- [HP Laserjet 400 Color M451dw installed as imaging device](#)
- [HP UPD Null Scan driver](#)
- [Issues after upgrade from HP UPD v5.2.x](#)
- [Settings issues after upgrading HP UPD](#)

High resolution TIFF files not printing correctly with HP UPD PCL 6

High resolution TIFF files with fine lines may not print correctly with the HP UPD PCL 6 driver. The same file prints correctly with PS.

Steps to Resolve the issue

This resolution can be made when printing, set as a printing default or pre-configured prior to installing the HP UPD using the HP Driver Configuration Utility (HP DCU).

1. From your application, click **File**.
2. Click **Print**
3. Click **Printer Properties**
4. Click the **Advanced** tab

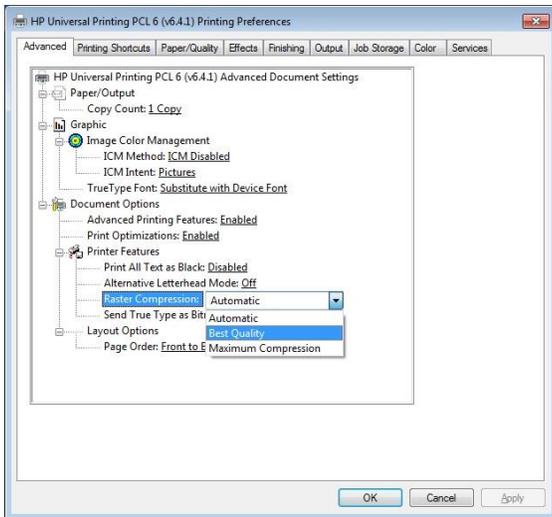


Figure B-1 Raster Compression Settings

5. Click the dropdown arrow for **Raster Compression**
6. Click **Best Quality**
7. Click **OK**
8. Click **Print**

HP Laserjet 400 Color M451dw installed as imaging device

HP Laserjet 400 Color M451dw installed as an imaging device instead of a printer after plug and play event on Windows 7.

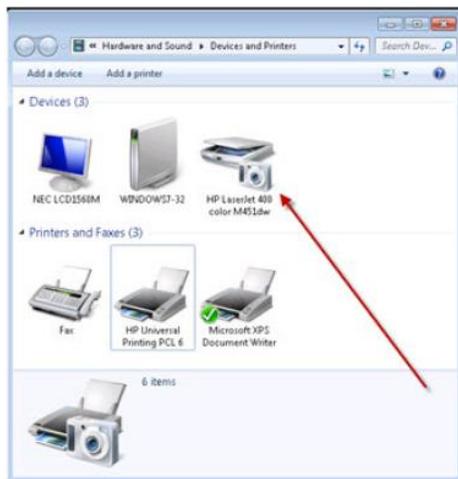


Figure B-2 Printer installed as a device

UPD 5.5 or later needs to be pre-installed before performing the following steps in this section.

- For Windows 7, this can be done using `pnputil -a *.inf`.

Method to delete the HP PNP Scan Null driver

In Windows 7:

1. Open Windows Explorer.
2. Go to windows\inf directory.

For Windows 7, the following steps are required:

- a. Open the **Organize** folder, and then click **Folder and search options**.
- b. Click the **Search** tab.
- c. Select the option to Always search file names and contents...
- d. Click **OK**

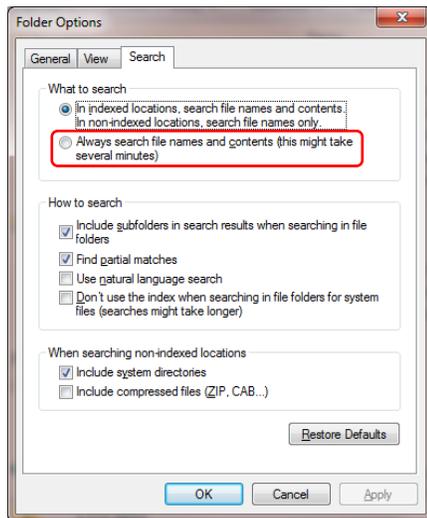


Figure B-3 Field Options Search tab

3. Search for *hppscnd* (within the files). If present, the search result will show one or more *oemxxx.inf* files.
4. Go to a command prompt (run as administrator) and type `pnputil -d oemxxx.inf`. Remove all scan null drivers found in the previous step.

NOTE: If the file is in use, it means that other printers are using the same file, which have to be deleted before the *hppscnd* files can be removed. These printers will have to be reinstalled/recreated after the HP LaserJet 400 color M451dw product has been installed correctly.

After following the above steps, all scan null drivers have been uninstalled/removed.

To reinstall the scan null driver:

For Windows 7, you can reinstall the HP UPD 5.5 including the scan null driver with the command `pnputil -a *.inf`. Then disconnect and reconnect the USB cable to restart the Plug and Play installation process.

Alternative method for Windows 7:

1. Open Device Manager, and then click Imaging Devices. You will see one or more HP PNP Scan Null drivers.
2. Right-click the first listed **HP PNP Scan Null** driver, and then select **Uninstall**. In the **Confirm Device Uninstall** window, select **Delete the driver software for this device**.

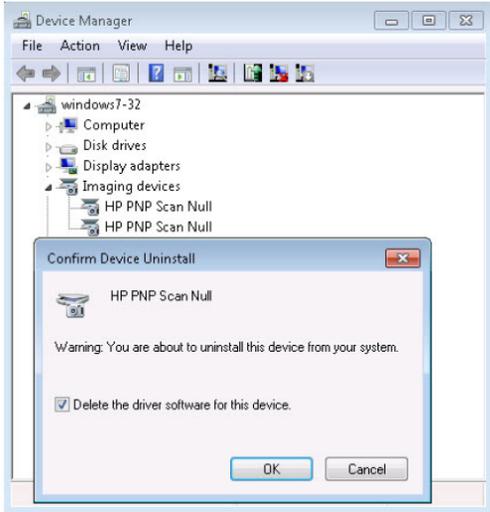


Figure B-4 Confirm Device Uninstall

Windows will now automatically try to reinstall the printer.

- If two HP PNP Scan Null drivers were displayed under **Imaging Devices**, no further action is required.
- If there are two old HP PNP Scan Null drivers installed, you will have to repeat the action in **Device Manager**.
- If only one HP PNP Scan Null driver was installed, you will have to reinstall HP UPD 5.5. Use pnputil-*.inf (drivers which are already installed will not get changed).

Then disconnect and reconnect the USB cable to restart the Plug and Play installation process.

HP UPD Null Scan driver

Introduction

The scan driver cannot be used for HP MFP products that are supported by the HP UPD when HP UPD v5.2.x or earlier is installed.

This section contains the following:

- **Install a Scan driver with and without HP UPD pre-installed**
- **Replace the HP PNP Scan Null driver with a product-specific Scan driver**

Install a Scan driver with and without HP UPD pre-installed

If you want to install a scan driver for an HP MFP product which is supported by the HP UPD using a plug and play event, you need to make sure that your system is pre-configured correctly before connecting to the printer using USB. The following approaches are possible:

- No HP UPD driver is installed on your Windows PC and the device specific scan driver is pre-installed on the Windows PC.
- HP UPD v5.3.1 or later is installed and the product-specific scan driver is pre-installed.

After connecting to the product using USB, the Scan driver is installed.

In order to be able to install a product-specific Scan driver after a plug and play event which did not install a scan driver, HP UPD v5.3.1 and later installs an HP PNP Scan Null driver if one or more of the of the following is true:

- There is no other scan driver installed on the system that provides a hardware ID match. This might happen if the driver is on the product CD and the device is connected before the driver is installed from the product CD.
- The driver(s) installed on the system that provide a hardware ID match are unsigned.
- The driver(s) installed on the system provide a compatible ID match and are older than the HP UPD.
- An earlier version (v5.2.x or earlier) is installed on the system.

How to identify if the HP PNP Scan Null driver has been installed:

1. Click **Start**.
2. Right-click **Computer** and select **Properties**.
3. Click **Device Manager**.
4. Click **Imaging devices**.

If the device is listed as HP PNP Scan Null, then the HP Null Scan driver is installed.

Replace the HP PNP Scan Null driver with a product-specific Scan driver

1. Click **Start**.
2. Right-click **Computer**, and then select **Properties**.
3. Click **Device Manager**.
4. Click **Imaging devices**.
5. Right-click **HP PNP Scan Null**, and select **Update Driver Software....**
6. Select **Browse my computer for driver software**.
7. Select **Let me pick from a list of device drivers on my computer**.
8. Select **Imaging Devices** and click **Next**.
9. If you have a product CD with the correct scan driver, select **Have Disk**. Otherwise, select **Hewlett-Packard** from the **Manufacturer** list, and the device model in the **Model** list. Click **Next**.



Figure B-5 Selecting printer model

10. If you receive the **Update Driver Warning** message, click **Yes** to install the driver.



Figure B-6 Update Driver Warning

11. Verify a scan operation works correctly.

Issues after upgrade from HP UPD v5.2.x

Introduction

A change was made in HP UPD v5.2.x that impacts printers that are upgraded to HP UPD v5.3.x or higher. The issue is isolated to environments that have installed HP UPD v5.2.x, followed by installation or printer upgrade to HP UPD v5.3.x or later releases. Symptoms appear after completing the driver upgrade.

This section contains the following for how to avoid and resolve this issue:

- [Symptoms](#)
- [Steps to avoid the v5.2 upgrade issue](#)
- [Steps to resolve the v5.2 upgrade issue](#)

The following three HP UPD releases create the issue described in this section:

Table B-1 UPD versions

UPD version release	Driver version
v5.2.0.8874	v61.109.9.8874
v5.2.5.9108	v61.111.1.9108
v5.2.6.9321	v61.112.01.9321

Symptoms

After upgrading a printer from HP UPD v5.2 to HP UPD v5.3 or later, symptoms could include the following:

NOTE: Actual symptoms depend upon the HP UPD v5.2 driver settings, client, and server installation.

- On the HP UPD **Effects** tab, **% of actual size** is set to **1%**. Located on the **Shortcuts** tab, the display of the document preview icon in the upper left will display scaled to 1%. Print job output is scaled accordingly, resulting in unreadable output.
- The **% of actual size** changes from **1%** to **25%** when moving between the **Printing Shortcuts** tab and the **Effects** tab after clicking the **Reset** option on the **Shortcuts** tab.
- On the HP UPD **Printing Shortcuts** tab, default shortcuts setting might change without user input. The **Save As** and **Reset** buttons may be enabled when no changes have been made by the user.
- On the HP UPD **Effects** tab, the Watermark pull down displays the string **[None]** and **[None]** (a space before [None]) which might cause the string "[None]" to be printed on the output page.
- On print products with a duplexer, the HP UPD **Finishing** tab displays **Print on both sides (manually)**, and printing causes a PCL-XL error with Simplex and Duplex jobs.
- On the HP UPD job **Storage** tab, job storage settings change after the HP UPD upgrade, such as **Pin** is no longer selected, blank **Custom username**, and **Job Name** change from **Custom** to **Automatic**.
- Garbage or garbled print on the output page.
- Point and print clients connecting through the server are impacted with symptoms described above.
- Incorrect print settings described above might persist in Excel application files after upgrade from HP UPD v5.2.x to v5.3 (Microsoft's KB829766).

Steps to avoid the HP UPD v5.2 upgrade issue

Systems that have not had HP UPD v5.2 installed are not impacted. Systems that have HP UPD v4x, v5.0.x, or v5.1.x can upgrade to HP UPD v5.3.x or higher without introducing or encountering the issue addressed in this advisory.

The best path to avoid this issue is to not install v5.2.x. If v5.2 is already installed, follow the upgrade guidelines below.

HP recommends HP UPD upgrade from v5.2 to v5.3 or later when:

- New print driver features introduced in HP UPD v5.3 or later is required
- Issues resolution delivered in HP UPD v5.3 or higher is required
- Driver support for recent Microsoft operating system releases is required (for example, Windows 8/8.1 and Windows Server 2012/2012R2 support introduced in HP UPD v5.6.0)

If a reason for upgrade does not exist, HP's recommendation is to keep printers/print queues on v5.2.x.

For systems that currently have HP UPD v5.2.x installed, and a reason exists to upgrade a printer/queue using HP UPD v5.2 to v5.3 or higher release, or a new printer/queue must be added to the system that requires v5.3 or higher, the following steps can be taken to avoid the v5.2 upgrade issue:

1. **Backup**—Before performing any driver upgrade, create a system backup.
2. **Adding a New Printer**—During the installation steps of HP UPD v5.3.x or higher, select the HP UPD version specific option within Add Printer Wizard or specify the /m switch if using HP UPD INSTALL.EXE. This step allows for installation of a newer version of HP UPD onto the system without causing existing HP UPD v5.2 printers on the same system to upgrade to v5.3 or higher. For example, select “HP Universal Printing PCL 6 (v5.3)” and not “HP Universal Printing PCL 6.” Failure to install following this recommendation would result in all printer names assigned the non-version-specific HP UPD driver name “HP Universal Printing [PCL 6/PS]” to be upgraded. For additional explanation of HP UPD driver names, see [Glossary of terms](#).

Choosing this avoidance path requires that all future installations of the HP UPD must also use the HP UPD version specific installation to prevent the upgrade of existing v5.2 printers.

3. **Upgrading an existing Printer**—Please refer to [Steps to resolve the v5.2 upgrade issue](#).

Steps to resolve the v5.2 upgrade issue

Upgrading a printer/print queue retains the printer’s name, assigned port, and print settings as the new print driver version is applied to the existing printer. The issue introduced in v5.2 prevents a printer’s settings from being properly retained following upgrade of the driver version. The resolution is to delete the printer name assigned driver versions released with HP UPD, and create a new printer using HP UPD v5.3 or higher.

For HP UPD v5.2 printers that must be upgraded to v5.3 or higher, or printers that have been upgraded from v5.2 and are experiencing the v5.2 upgrade symptoms, the most predictable and reliable resolution is to delete and create a new printer with the same name using the HP UPD v5.3 or higher. The new printer created will use the HP UPD installation defaults. It is not necessary to delete existing ports. In addition, the HP UPD v5.2 driver can remain in the Windows driver store after HP UPD v5.3 has been installed.

WARNING! From the **Device and Printers** folder or Print Management Console, do not use the **Advance** tab from **Printer Properties** to change an existing printer assigned HP UPD v5.2 version driver to an HP UPD v5.3 or higher version driver. This action would upgrade the selected printer from driver v5.2 to the driver version selected in the pull-down menu creating the v5.2 upgrade issue discussed in this section. The following steps will instruct how to delete the printer, and then add a new printer using HP UPD v5.3 or higher.

Steps to delete a printer

The steps below assume the version specific release of HP UPD v5.3 or higher has already been installed on the system. To delete an HP UPD print object assigned the HP UPD v5.2 driver version that will be upgraded, or for a printer that was upgraded from v5.2 to v5.3 or later, perform the following steps:

1. From the **Device and Printers** folder, select the printer name using the HP UPD v5.2 driver version that you wish to upgrade to v5.3 or higher.
2. Understanding the symptoms described in this section, record the correct settings for the printer. This list will be used to help re-create the new printer with the same settings. For example:

Printer Name: PCL 6-COLOR

Port: 10.0.0.150

Duplex: On

Custom Shortcuts: Name and settings

3. Select the printer, right-click, and then select **Remove Device** or **Delete**. Confirm **Yes** to delete the printer. This action deletes the printer, but it does not delete the print driver from the Windows driver store.

Steps to delete the print driver (optional)

The following steps are optional and not required to resolve the symptoms. This step would prevent introduction of this issue for any newly created printers. Steps to delete a driver from the system:

1. In the **Printers** folder, select a print queue, click **Print server properties** at the top of the dialog and then select the **Drivers** tab.
2. Select the HP UPD driver(s) to be uninstalled, and then click Remove. If Windows displays an error message that the driver is in use, stop and restart the print spooler at the command prompt using Administrator privilege with the following command, and then repeat the steps:

```
net stop spooler && net start spooler
```

Steps to create the printer with same name

Utilize one of the supported HP UPD methods to add a new HP UPD printer.

1. Add Printer Wizard or HP UPD INSTALL.EXE.
2. Assign the previously used port to the newly created printer.
3. Specify the HP UPD v5.3 or higher version-specific driver version to the new printer (for example, **HP Universal Printing PCL 6 (v5.3)**).
4. Rename the printer to its original printer name (for example, **PCL 6-COLOR**).
5. Apply any custom settings to the printer (duplex, shortcuts, etc).

Point and print

If the printer queue was shared, point and print clients might need to reset their connection to the print server following the server's delete and recreate event of the shared printer name. This can be accomplished using the PRNCON tool available in the HP PARK. For more information on the HP PARK in this document, see [HP Print Administrator's Resource Kit \(PARK\)](#) in chapter 4.

Automating the steps

For large scale environments, HP recommends using the AutoUpgradeUPD tool available in the HP PARK. This utility deletes the defined print queue(s) and creates a new print queue(s) using the same printer name, comments, location, and assigned port while applying the specified new driver version. During the print queue delete and recreate process that is completed by the tool, only the print queue name, port, location, comments, share name, and share state will be retained. All the other settings on the new print queue will be set to HP UPD factory defaults. Administrators can define custom default settings for the newly created queues (for example, duplex or grayscale) used by the AutoUpdateUPD by incorporating the Driver Configuration Utility into the solution, also available in the HP PARK. Please reference the HP PARK for complete instructions, or for more information on the HP PARK in this document, see [HP Print Administrator's Resource Kit \(PARK\)](#) in chapter 4.

Settings issues after upgrading HP UPD

When switching from earlier HP printer drivers, many customers have noticed that the paper type has changed from **Unspecified to Plain or Heavy Media** (others types are also reported). For example, this could be seen in an upgrade from HP UPD v4.1 to v5.0. The paper type change is caused by a mismatch in the way settings are stored in the old driver and the new driver. For this reason, upgrading is **not** supported. To work around this issue, first delete the existing printer and driver, install a later driver, and then create a new printer.

Environments that experience these symptoms will need to reset the settings. Assuming HP UPD v4.5 or higher installation on a server or client, the solution is to delete the old HP printer name and the existing HP printer and driver on both the server and all connecting clients (see [Uninstall the HP UPD](#) in chapter 5). Next, recreate the printer on the server. Point and print clients will need to delete the printer and reestablish the connection to the print server. When the printer is recreated, Windows will create new settings that match the architecture for the new printer. There is no need to delete and replace the ports associated with the deleted printer.

For enterprise deployments requiring tools support of this process, please reference the HP Printer Administrators Resource Kit (HP PARK) to test with the PRNCON tool (see the Release Notes for this HP unsupported tool). For more information on the HP PARK in this document, see [HP Print Administrator's Resource Kit \(PARK\)](#) in chapter 4.

To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

C Third-party articles and Windows printing information

This appendix contains a list of useful articles. In addition, some background information about printing on Windows systems is also provided.

The Microsoft articles listed in this appendix can be found on the Microsoft Knowledge Base Web site using the following URL format: <http://support.microsoft.com/kb/<article number>>

The following table lists the articles.

Table C-1 Important MS articles

Category	Microsoft Knowledge Base Article Number	Description
Performance	2666508	Intermittent High CPU and Increased Disk I/O with SPOOLSV.EXE When Mapping TS User Session Printers on Windows Server 2008R2.
	2526028	Printing performance decreases in Windows 7 or in Windows Server 2008R2
	2295825	Poor printing performance in Windows 7 or in Windows Server 2008R2 compared to the performance in Windows Vista or in Windows Server 2008
	955560	Handle leaks and memory leaks occur on the Printer Spooler service when a Windows Vista SP1-based computer or a Windows Server 2008-based computer installs and uninstalls network printers.
Update rollup for the printing core components that are included in Windows 7 and in Windows Server 2008R2	2647753	Update rollup: Resolves printing issues in Windows 7 and Windows Server 2008R2 that are described in the following Microsoft Knowledge Base (KB) articles: 942914, 976571, 979241, 979681, 981620, 982728, 2295825, 2388142, 2457866, 2461108, 2480118, 2526028, 2532459, 2546651, and 2620656.
Generic Windows behavior (printer installations)	2511290	A computer that is running Windows 7, Windows Vista, Windows Server 2008 or Windows Server 2008R2 continues to use the original print driver after you update or replace the print driver.
	2004234	After upgrading a print driver on any Microsoft Operating system later than Windows XP and Server 2003, the old driver files are still being used.
	983401	A long delay occurs when you print a large file on a Windows 7 or Windows Server 2008R2-based computer

Category	Microsoft Knowledge Base Article Number	Description
	982728	"Windows cannot connect to printer" error message when you try to create a Point and Print connection to a remote printer from a Windows 7 or Windows Server 2008R2-based client computer.
	829766	Mailbox and other printer-specific settings are saved with an Excel file (excel hot fix available)
Microsoft Office issues	2746927	Transparent circles print as squares in Booklet mode
	937496	Description of the Word 2007 hotfix package: May 22, 2007
	815001	The transparent objects cannot be printed correctly in PowerPoint
	312250	Objects with transparency are printed as opaque to printer or to file in PowerPoint for Mac.
Miscellaneous	3201130	Printing preferences from the print server don't synchronize in Windows 10 version 1607
	3057039	Printing from Adobe in booklet format results in large black squares
	3001232	Print jobs fail in Windows 7 and Windows Server 2008R2. This problem occurs when the DependentFiles registry key for the driver that is used by the printer is overwritten by a NULL string.
	2900635	GetOption or SetOptions method of IPrintCoreHelper interface does not update print device settings in Windows. This is a pre-requisite for proper device settings update during an upgrade to any device using a newer driver than UPD 5.6.0.
	2871131	The size of the "HKEY_USERS\DEFAULT" registry hive continuously increases on a Windows Server-based server
	2796647	Memory leak occurs in the Spoolsv.exe process after you run an application that performs WMI queries in Windows 7 or Windows Server 2008R2
	2793718	You experience Print Spooler error messages after installing or upgrading a Third-Party print driver.
	2762101	Not able to print with Type 4 or Type 3 XPS printer drivers after a Windows Server is promoted to a Domain Controller.
	2746927	Transparent circles print as squares in Booklet mode.
	2666508	Intermittent High CPU and Increased Disk I/O with SPOOLSV.EXE When Mapping TS User Session Printers on Windows Server 2008R2
	2647753	Update rollup: Fix printing problems in Windows 7 and in Windows Server 2008R2 that are described in the following Microsoft Knowledge Base (KB) articles: 942914, 976571, 979241, 979681, 981620, 982728, 2295825, 2388142, 2457866, 2461108, 2480118, 2526028, 2532459, 2546651, and 2620656
	2620656	Invalid redirected printers may be available in a Remote Desktop Services session that connects to a RD Session Host server that is running Windows Server 2008 or Windows Server 2008R2.
	2511290	A computer that is running Windows 7, Windows Vista, Windows Server 2008 or Windows Server 2008R2 continues to use the original printer driver after you update or replace the printer driver.
	2480910	Wrong printer forms for network printers are used in Windows Server 2008 or in Windows Vista

Category	Microsoft Knowledge Base Article Number	Description
	2388142	A computer that is running Windows 7 or Windows Server 2008R2 intermittently cannot use a shared network printer to print.
	2004234	After upgrading a printer driver on any Microsoft Operating system later than Windows XP and Server 2003, the old driver files are still being used.
	979681	FIX: A legacy HP printer driver may crash when you run a 32-bit application on a computer that is running a 64-bit version of Windows 7 or of Windows Server 2008R2.
	976571	Stability update for Windows Server 2008R2 Failover Print Clusters.
	972616	You cannot use the "runas" command to print from different user accounts in a single session from a 32-bit program on a computer that is running 64-bit version of Windows Server 2008 or Windows Vista
	972026	Some print jobs fail together with the Event 6161 when the "Print to File" option is used on a multiprocessor computer that is running Windows Server 2008 or Windows Vista and that is under heavy stress
	919543	The size of the EMF spool file might become very large when you print a document that contains lots of raster data.

Table C-2 Important Adobe articles

Category	Adobe Article URL	Description
Miscellaneous	https://helpx.adobe.com/acrobat/kb/prn-files-using-pcl-printing-increases-file-size.html	Slow PCL printing if a PDF file has a non-system font embedded

The following table provides a list of URLs that contains miscellaneous background information.

Table C-3 Background information

Category	Article URL
Updating Windows 8 for General Availability	http://blogs.msdn.com/b/b8/archive/2012/10/09/updating-windows-8-for-general-availability.aspx
Background information about driver store and /inf directory	http://msdn.microsoft.com/en-us/library/ff545861%28VS.85%29.aspx
Microsoft Driver Store and /inf Directory	msdn.microsoft.com/en-us/library/ff545861%28VS.85%29.aspx
Windows Print Cluster Best Practices (Windows Server 2003 to Windows Server 2008R2)	blogs.technet.com/b/askperf/archive/2010/11/12/windowsprint-cluster-best-practices-for-windows-server-2003-towindows-server-2008-r2.aspx
<p>NOTE: The listed article explains why HP UPD must be installed on the physical nodes and virtual node in a cluster.</p>	

D Frequently asked questions

Introduction

This appendix contains the following sections:

- [HP UPD installation and configuration](#)
- [HP UPD policy](#)
- [Operating system](#)

HP UPD installation and configuration

Use this section to find answers to common installation and configuration questions.

1. Can I pre-configure the HP UPD using HP Web Jetadmin and the HP Driver Configuration Utility?

Yes. The HP UPD supports pre-configuration through HP Web Jetadmin and the HP Driver Configuration Utility.

2. Is the printer queried every time it is printed to?

For traditional mode queues, no. The printer is queried once and the settings are cached. In dynamic mode where a user has chosen to create a permanent instance of the printer, or is printing to one of the printers in the recently used list, settings are also cached. The only time the printer would be queried every time it is printed to is in dynamic mode if for some reason the settings could not be cached due to folder write restrictions in the user's %TEMP% and %TMP% folders.

When the Status Notification Pop-ups (SNP) are enabled, the HP UPD sends a few packets to the printer to gather printer status information.

NOTE: Status Notification Pop-ups (SNP) are no longer available starting with the release of UPD 6.5.0.

3. Are traditional mode queues updated with a new driver, too?

Yes. The Microsoft operating system will update all instances because the driver name is the same (with different registry entries) for permanent instances. All queues sharing the same driver name will update.

4. How can I have permanent instances re-query a product?

As with other HP drivers, there is the ability to select an **Update Now** button or use the command line option. See [Printer Automatic Configuration](#) in chapter 7.

5. Which port monitor is used with the HP UPD?

By default, the HP UPD uses the standard TCP/IP port monitor. For cases where the HP UPD is pointed to an existing print queue shared out from a print server instead of a printer itself, the “HP UNC Port” monitor is used.

For cases where locally installed products are selected, the LPTX, USB00X, or DOT4 port will be used. This depends on the USB protocol that is negotiated between the HP UPD and the product.

HP has its own version of the TCP/IP port monitor for communicating with network products. It is not part of the installer package of the HP UPD.

6. Is it possible to suppress the HP UPD Status Notification Pop-ups (SNPs) on the client machine installed from a print server?

NOTE: Status Notification Pop-ups (SNP) are no longer available starting with the release of UPD 6.5.0. On HP UPD v4.7 through UPD v6.4.1, SNP can be enabled or disabled from the Device Settings tab of the driver. Before HP UPD v4.7, SNP could only be disabled from the SNP dialog box.

7. How do I set defaults for the driver on the server so all installs have the same defaults?

Configure the driver using the HP Driver Configuration Utility (DCU).

8. How does the static mode install command line switch work?

The static mode install command line switch, in versions 3.0 and newer, uses the port name specified by the /sm switch if the specified port exists. If that port does not exist, the HP UPD install creates a new port. In the normal operation of printing with the HP UPD, once the printer binds to a port, the job is delivered to that port (and associated port monitor) no matter what the port is named.

9. If my product can be discovered by the HP UPD via mDNS but cannot communicate via SNMP, what is the issue?

If the product can be discovered by way of mDNS but cannot communicate by way of SNMP, it is possible that the Jetdirect is configured so that SNMP is disabled. It is also possible that SNMP is disabled or might be using a non-default SNMP community name.

10. Can the HP UPD installation change the target port's SNMP community name (i.e. can it replace the current name and with a different SNMP community name)?

Yes, you can set or change the community name in the port using INSTALL.EXE. The installer switch was put there to set the community name at the time the port is created. Example: /gcomname”name”.

11. What version did the HP UPD begin using unique file names?

Starting with HP UPD v4.5, driver file names for each release are uniquely named to prevent overwriting existing files that might have shared dependency. Beginning with HP UPD v4.7, more than one version can be installed when using HP UPD in traditional mode onto the host, if during the installation process the model specific version of the HP UPD was selected through the Add Printer Wizard and, beginning with HP UPD v5.0, using the /m switch with INSTALL.EXE.

NOTE: HP UPD v5.2.6 and earlier require that the full name and version are provided with the /m switch, for example “HP Universal Printing PCL 6 (v5.2)”. HP UPD v5.3 and later does not require the full name or version when using the /m switch.

12. Any tips for using Microsoft's PrintMig?

Testing has found limitations using the PrintMig tool with both HP and non HP drivers. For the HP UPD, install the HP UPD first on the target host to register all files and COM objects, then perform the PrintMig restore onto the host. PrintMig tool has been placed on end of life by Microsoft.

13. What is the first step during upgrade?

Avoiding unintended issues resulting in a change to the shared UNIDRV and postscript files has been an issue. Updates to these files come unannounced and unplanned through update services, installation of service packs, .NET framework, or a hot fix from Microsoft that might negatively impact driver upgrades dependent upon UNIDRV and PSCRIPT version.

Upgrade has several steps that should be followed. To see what version of UNIDRV and PSCRIPT files are on the system and compare against the version you are about to install, see [Versioning of print driver shared files](#) in Appendix F. If the versions are different, this might increase the scope of testing required for an uneventful upgrade. For the HP recommended upgrade steps, see [Upgrading the HP UPD](#) in chapter 6.

14. Is there a tool or method available to force clients to disconnect their print connection to the print server and re-establish the connection?

A tool for this function can be found in the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

15. HP UPD displays "HP Universal Printing PDL**" in the **Printers** folder. How can I make the HP UPD display the printer model name instead?

A tool for this function can be found in the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

16. Are there thresholds or guidance limiters to scaling the HP UPD on a single print server?

HP UPD does not have a bounded limit to scale of installation. The recommendation of how many queues to install on a single server is entirely site dependent. Questions such as this are best answered by IT administrator policy placing criteria on status and monitoring, server disk/CPU/network IO utilization rates, print job throughput, peak load times, etc. Some very well managed sites with resources can run 1000 print queues on the right server with redundancy and high availability requirements satisfied.

17. What does WHQL look at when it breaks: file byte size, date of file, etc?

When the driver is signed, part of the process is creating a hash of the contents of all the files that are part of the driver, including the .cfg or .cf_ file. If you alter even one bit in any file, the hash breaks.

18. Why am I unable to delete the HP UPD print driver?

The print spooler must be stopped to release the HP UPD print driver. Perform the following on the command line: C:\NET STOP SPOOLER && NET START SPOOLER.

19. How can I select the version specific driver in Windows 2008 R2 and Windows 7 when using INSTALL.EXE and creating a new port during the installation?

When you use INSTALL.EXE to install HP UPD in traditional mode, you can select **Add a local printer**. When selected, you can create a new port using the **Standard TCP/IP Port**, you can select **Query the printer and automatically select the driver to use** in the screen titled **Type the printer hostname or IP address**. By default this query option is enabled. In order to see the driver specific version you have to disable the query option.

20. When I delete a printer that is using the HP UPD print driver, is the standard TCP/IP port also deleted?

This depends. On Windows 7, Windows 2008, and Windows 2008 R2, the printer is deleted and the port associated with the printer is deleted (providing the port is not in use by another printer).

21. The datestamp for hp upd *.CFG files (such as HPCPU118.CFG) is always 3/12/1990. Is this an error?

No, this is done on purpose in order to get predictable configuration settings in different environments.

22. In some applications it is possible to select a different paper source per page in the document. Is this supported with the HP UPD?

The HP UPD supports different tray numbers per page of the document and one paper type per document.

23. After installing the HP UPD and creating a printer queue which is printing to a monochrome product, the **Color** tab is still visible in the properties of the printer queue (and not in printing preferences or printing defaults). How can this **Color** tab get removed in the properties screen?

This behavior is controlled by the operating system, not by the HP UPD and cannot be changed by a HP UPD setting.

HP UPD policy

Use this section to find answers to common questions regarding use of the HP UPD with Active Directory.

1. If I have the HP UPD Active Directory Group Policy running simultaneously, which set of policies take priority?

The HP UPD Active Directory Group Policy takes precedence over default settings.

2. How can I set up printer lists for each user?

Printer lists can be created by exporting printer lists from HP Web Jetadmin into XML format.

3. Are both modes of the HP UPD (traditional and dynamic) managed through Active Directory Group Policy?

Both operating modes of the HP UPD are manageable through the Active Directory Group Policy.

4. What versions of the HP UPD support the Active Directory Group Policy?

HP UPD v4.0 and newer.

5. How much does the HP UPD Active Directory Administrator Template cost?

The HP UPD Active Directory Administrator Template file is available for download at no charge from www.hp.com/go/upd as part of HP PARK.

6. Are both modes of the HP UPD (traditional and dynamic) managed through the HP UPD Active Directory Administrator Group Policy?

Yes, both operating modes of the HP UPD are manageable through the Active Directory Group Policy.

NOTE: HP UPD Active Directory Administrator Group Policy does not work in a Point-and-Print configuration.

Operating system

Use this section to find answers to common questions regarding use of the HP UPD with various operating systems.

1. What about use in an Apple Macintosh Environment?

There are no plans for a Macintosh version of the driver. HP drivers can be used, however, with the Apple Bonjour™ (formerly Rendezvous™) discovery mechanism. Bonjour behaves the same way the HP UPD does when looking for products on the local subnet (using mDNS).

2. Does the HP UPD support XPS print paths?

XPS print path requires a product that consumes native XPS, an application that sends native XPS and an XPS print driver to send XPS data to the an XPS print product. If each step in the path is not native XPS, it requires conversion of the print content. HP UPD does offer an HP XPS print driver. Please contact HP support for download location and documentation.

3. What is the HP Port Monitor?

The port monitor that the HP UPD uses is the standard TCP/IP port monitor that is part of the operating system. There is an HP UPD Port monitor that is installed, but it is used only to provide a print path to UNCpaths or shares, send print settings to a local printer, and send jobs to a defined HTTP location for job tracking.

4. Can HP UPD be used with direct IPP printing?

Yes. HP UPD can print via IPP. When you use **Add Printer Wizard**, you can select **A network printer, or a printer attached to another computer**. For IPP printing specify: `http://<Printer IP>/ipp` or `https://<Printer IP>/ipp`

5. Can the HP UPD be used to print via IPP to a print server?

Yes, client/server printing with HP UPD over IPP is possible. See the Windows Server documentation for instructions on how to install the Internet Printing role and install printers on client systems.

6. Can the HP UPD be used with Web Services Delivery (WSD) port?

Yes, HP UPD can print via WSD. One way to use Web Services Delivery in Windows 2008 and Windows 7 is with print manager. Install a new printer with print manager with **Type of Device** set to **Web Services Printer**. If HP UPD was preinstalled, the HP UPD driver is automatically selected during printer creation and the HP UPD will use a WSD port for printing.

E HP UPD deployment worksheet

Introduction

Use this worksheet to guide your HP UPD deployment.

This appendix contains the following sections:

- **General information**
- **Print server environment**
- **Direct IP printing**

General information

Do you primarily print in color or black and white?

- Would your company prefer that all users print in grayscale, with the option to manually select color?

Are users defaulted to print in simplex (single-sided) or duplex (double-sided)?

- Would your company prefer that all users or user groups print in simplex or duplex?

Are all users in your Windows environment Local Administrators to their PC?

- If not, please specify the default capabilities for the user.

Are there any government or industrial regulations or restrictions regarding the process of print jobs?

- Are all printer log files retained? What is your process for retaining printer log files?

Is there a preferred driver language (PCL 6 or PS) for printing?

Do users have any special production or operational environments (non-application print) which require specialized drivers or non-standard printer drivers?

Do any groups or users use PIN printing? If so, please specify the groups or users that use PIN printing.

Do any groups or users use encrypted printing? If so, please specify the groups or users that use encrypted printing.

Port and protocol information

Port Monitor

- Standard TCP/IP Port?
- HP Standard Port Monitor?

RAW or LPR?

How are IP addresses distributed to your printers?

- If static IP addresses are distributed, how are they reserved (DNS, DHCP reservation, BOOTP)?
- Are printers set to DHCP, BOOTP, or Manual when configuring the IP address?

Ports and protocols

- Is SNMP enabled in your environment across all subnets?
 - If not, please describe the subnets where SNMP is disabled and if it is possible to enable SNMP.
- What versions of SNMP (SNMP v1, v2, v3, other) are enabled in your network infrastructure?
- Verify that "Get Community" names values are consistent.
 - Bi-directional communication between the HP UPD and printer is required to gather product specific configuration information.
- Make sure mDNS broadcasts and IP multicast services are allowed on the network for the HP UPD to discover products.
 - In dynamic mode, the HP UPD will only discover products within the same subnet when **Search for network printers** is selected.
- Activate the mDNS protocol on the printer/product using the HP Embedded Web Server (EWS).
- Make sure a firewall or router is properly configured to allow the HP UPD to communicate over the necessary network ports.

Table E-1 Network Ports used by the HP UPD

Port	Type	Service	Used by
161	udp	SNMP	HP UPD
53	tcp	DNS query	HP UPD
5353, 5354	udp	Multicast DNS	HP UPD
80	tcp	HTTP	HP UPD, HP EWS
9100	tcp	Print Data	HP UPD, Printer

Print server environment

Please fill out this section for each server to be migrated.

Print server information

How many current print servers are in production in your current environment?

Is there a print server for each location or are there regional print servers?

- If the answer is more than one, a checklist needs to be filled out for each of the servers that are to be created or migrated.

Server Name _____

Operating system

- Version _____
- 32-bit or 64-bit? _____

Cluster environment? _____

- Active-Active or Active-Passive? _____
- Names of Physical Nodes _____

Is this print server dedicated, or does this server have other server roles (file/printer, DNS/print, etc)?

Total number of print queues on the server? _____

Print queue settings

- Pre-configuration settings
 - _____
 - _____
 - _____
- Are there any security settings such as Access Control Lists (ACLs) that you want configured for products at the printer or queue level?

Goals

- **New**—Set up new server that has new queue names?
- **Replace**—Set up new server to replace an existing server that has the same queue names as the existing server?
- **Upgrade**—Upgrading print queues on an existing server to the HP UPD?

Set up new server that has new queue names

Print queues and drivers:

- Prepare a list of the following information.
 - Queue name
 - HP printer model
 - Port name and/or IP address

Driver List:

- Not all HP printer models are supported by HP UPD. Compare this newly created list to the list of products supported by HP UPD. A list of supported products is available at www.hp.com/go/upd.
- Mark a list to indicate which queues will use HP UPD, and which queues will require a product specific driver.

Upgrade print queues on an existing server to the HP UPD

How will be server be backed up before the migration begins?

- Use the Microsoft Print Migrator 3.1 tool or the Server 2008/Vista PrintBrm.exe utility to back up the print servers.
- Will the backup be verified? _____

Test server available? _____

- Attempting to upgrade drivers to the HP UPD on a running production server is NOT RECOMMENDED.
- Will the test server become the new production server, or will the production server need to also be updated? _____

Microsoft file version information:

- UNIDRV.DLL File Version? _____
- PSCRIPT5.DLL File Version? _____

Print queues and drivers:

- Prepare a list of list of the following information.
 - Queue name
 - HP Driver name or HP printer model
 - Driver version
 - Port name and IP address
 - Kernel or user mode driver?
- You can create this list automatically by running the prnmngr.vbs script on the server.

Driver Mapping

- Not all of the hp drivers on the existing system can be migrated to the HP UPD. Compare this newly created list to the list of products supported by HP UPD to develop a list of potential migration candidates.
- Decide what you want to migrate?
 - Everything that is supported by the HP UPD to the HP UPD
 - Only HP kernel mode drivers
 - Install the HP UPD for new products only

- Mark the list to indicate which queues will use the HP UPD, and which queues will require a “native” driver.

Print queue settings

- Pre-configuration settings

- _____
- _____
- _____

- Are there any security settings such as Access Control Lists (ACLs) that you want configured for products at the printer or queue level?

Point and Print Client Information

Citrix, or Terminal Services? _____

Citrix version? _____

How many clients?

- Windows 7 32-bit _____
- Windows 7 64-bit _____
- Windows 8/8.1 32-bit _____
- Windows 8/8.1 64-bit _____
- Windows 10 32-bit _____
- Windows 10 64-bit _____

Does the capability exist to run software or adjust client settings via login scripts or AD Group Policy?

Direct IP printing

General client information

Citrix, or Terminal Services? _____

Citrix version? _____

How many clients?

- Windows 7 32-bit _____
- Windows 7 64-bit _____
- Windows 8/8.1 32-bit _____
- Windows 8/8.1 64-bit _____
- Windows 10 32-bit _____
- Windows 10 64-bit _____

Does the capability exist to run software or adjust client settings via login scripts or AD Group Policy?

Are the client PC's typically used exclusively by one user or shared by many users?

How many current drivers are stored in the print driver repository/library (if applicable)?

Is there a default driver language (PCL 6 or PS) for end-user printing?

- Can users request an alternate Driver language from the default (i.e., prefers PS over PCL 6 for .PDF files?)

Total number of printers on a typical client? _____

Printer settings

- Pre-configuration settings
 - _____
 - _____
 - _____

Goal

- **New**—Set up new printers on a client using the HP UPD in traditional mode.
- **Dynamic**—Install the HP UPD in dynamic mode.
- **Upgrade**—Upgrade existing printers on the client to the HP UPD traditional mode.

Upgrade-Drivers:

- Run the prnmngr.vbs script on the client to create a list of the HP drivers currently on the client.
- If you create this list yourself, please include the following information:
 - Driver name or printer model supported
 - Version
 - Kernel or user mode?

- Not all of the HP drivers on the client can be upgraded to the HP UPD. Compare the newly created list with the list of products supported by the HP UPD to develop a list of potential migration candidates. A list of supported products is available at www.hp.com/go/upd.

Upgrade-Settings configuration

Existing printer settings. Do you want to:

- Keep current queue settings? _____
- Pre-configure settings in addition to migrating current settings? _____
- Pre-configuration settings
 - _____
 - _____
 - _____
- Pre-configure the queues that cannot have settings migrated? _____
- Pre-configuration settings
 - _____
 - _____
 - _____

Are any security settings such as Access Control Lists (ACLs) configured for products at the printer or queue level?

HP UPD/AD customized options

Would you like policy or access control restrictions to be set based on user ID?

Would you like Color access control to be set configured with Time of Day restrictions (days/hours)?

Is there a preference to allow or disable specific applications (WINWORD.EXE, EXCEL.EXE, etc) to print in Color?

Is there a preference as to how users can search for printers (see below)?

- On the user's local subnet
- Using Managed printer lists

How would you prefer users view the list of printers (see below)

- A default view (list of printer names)
- Through a list showing customized groups (i.e., MFP, Color, B/W)
- A clickable image (possibly a floor layout in .jpg, .bmp or html format) that might be uploaded

Would you like your users to receive a pop-up status message for their print job?

- Which message pop-ups are preferred? Select to show all, some, or none from the following:
 - Job Completion
 - Supplies Details link
 - Shop for Supplies link
 - HP Support link for product specific online help
 - Other

F HP UPD deployment flowcharts

Introduction

The HP UPD can be installed and configured many ways. The following flowcharts contain green lines which outline the recommended deployment paths. These configurations allow for the simplest deployment and implement the full functionality of the HP UPD. All of the paths outlined on the flowcharts are supported, but following some of the paths might involve extra steps or limit the functionality of the HP UPD. There are valid technical and business reasons for using the alternate paths, but when in doubt, follow the green line.

This appendix contains the following sections:

- **Start**
- **Update server/replace server**
- **Client printing**
- **Policy**
- **Add/new queues**
- **Create queues**
- **Ports and protocols**
- **Replace drivers**
- **Versioning of print driver shared files**
- **Automate the process through scripting**

Start

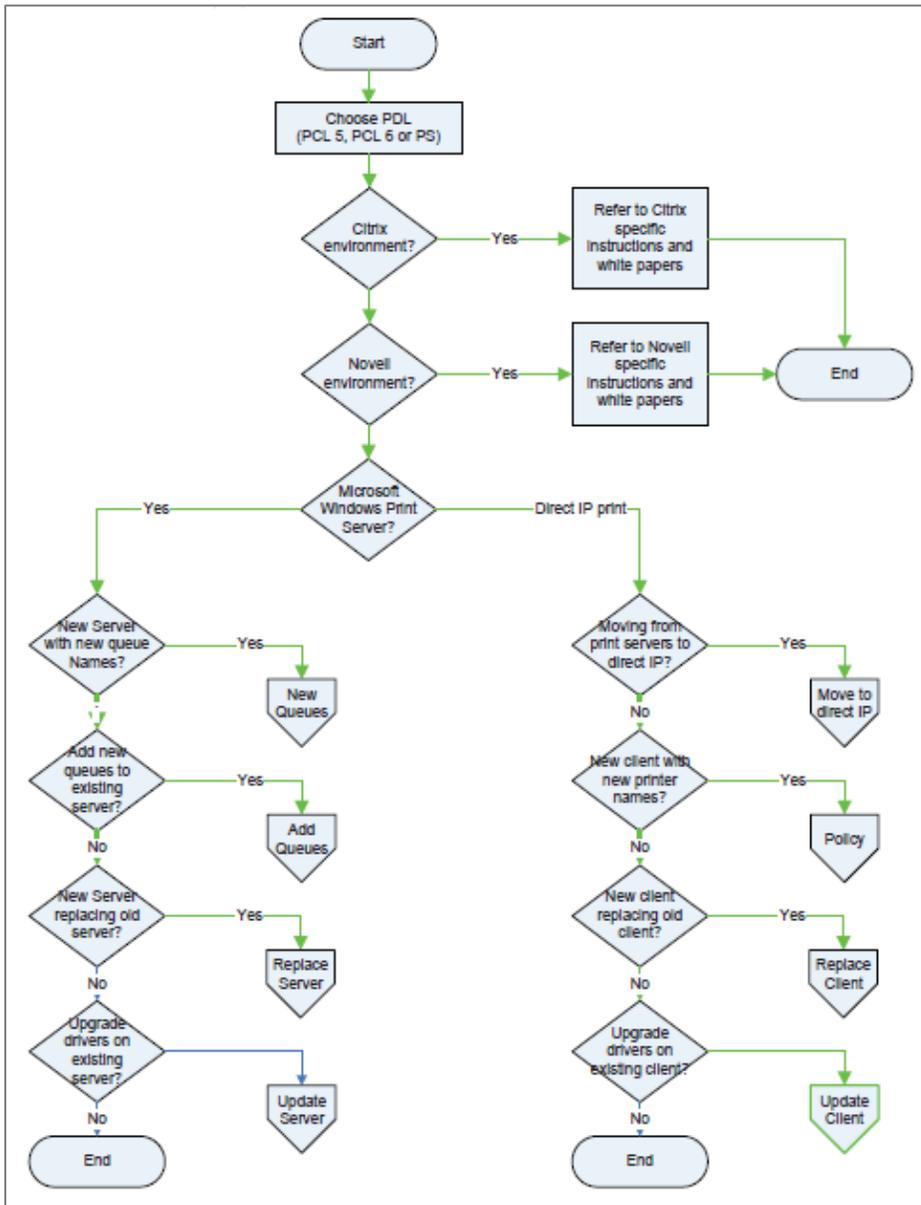


Figure F-1 HP UPD deployment start

Choose PDL (PCL 6 or PS)

The first step is to decide which HP UPD PDLs (Page Description Language) to install. The HP UPD offers a choice of postscript and PCL 6.

Citrix environment

See the HP white paper *HP Printers Supported in Citrix Presentation Server Environments* at www.hp.com/go/upd for more information.

Novell environment

See [Environment C: Novell](#) in chapter 5 for more information.

Microsoft Windows Print Server

In a print server environment, there are four possible ways to deploy the HP UPD.

1. New server with new queue names.

In this scenario the administrator sets up a new print server and assigns new names to all the print queues.

2. Add new queues to existing server.

In this scenario the administrator adds the HP UPD to an existing print server and creates additional queues using the HP UPD.

3. A new server replacing an old server.

In this scenario the administrator sets up a new print server that replaces an existing print server. This scenario differs from scenario #1 because the administrator wants this server to have the same queue names as the server it replaces to minimize impact on existing traditional mode installed client connections.

4. Upgrade drivers on existing server

In this scenario the administrator upgrades the existing HP drivers on an existing print server to the latest version of the HP UPD.

Direct IP printing

Direct IP printing is an environment where the Windows client prints directly to the product, either network connected or directly connected with a USB or LPT port. In the Direct IP Printing environment there are four possible ways to deploy the HP UPD.

1. Moving from print servers to direct IP printing.

In this scenario the administrator moves from a print server environment to direct IP printing.

2. New client with new printer names

In this scenario the administrator installs new client PC's and uses the HP UPD.

3. New client replacing old client.

In this scenario the administrator replaces or upgrades client PC hardware or operating systems and uses the HP UPD. The administrator wants the new PC to have the same list of printers with the same names as the old PC to minimize impact on the users, or the users might not have administrator rights and cannot add printers.

4. Upgrade drivers on existing client.

In this scenario the administrator upgrades the existing HP drivers on an existing client to the latest version of the HP UPD.

Client driver deployment and software distribution systems

Print driver installation must be done through an account that has administrator rights on the client PC. This is how the Windows operating system is designed, and it is for good security reasons.

If all the client users have administrator rights, the HP UPD can be deployed with the following methods.

- Create a login script that will perform the installation.
- Put the HP UPD on local file system or a file share that is accessible to all users.

If the client users do not have administrator rights, then the installations need to be done either by someone that has administrator rights, or by a software distribution system.

Details about specific software distribution systems (SDS) are beyond the scope of this document, however some general guidelines can be offered. The steps in this document should be compatible with any SDS that has the following capabilities.

- Create a package that contains a program (INSTALL.EXE) and the driver.
- Deploy the package to the client(s).
- Log on as an administrator, and run the program (INSTALL.EXE) with HP UPD's command line options.

Update server/replace server

This section applies to print server deployments only.

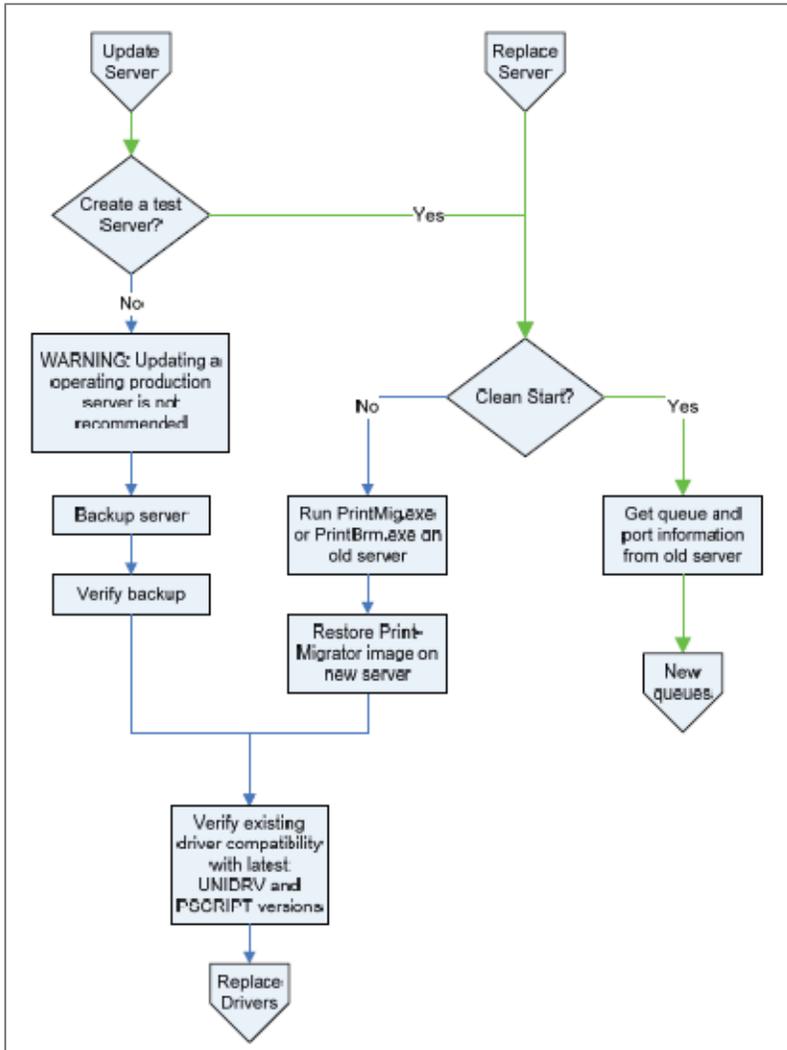


Figure F-2 Print server deployments

Update server

When considering an update to an operating production server, it is strongly advised to set up a test server and perform the initial upgrade and testing on the test server.

Create a test server?

The procedure for a clean start is similar to replacing an existing server.

Replace server—clean start

Get queue and port information from the old server.

The Microsoft tools `prnmngr.vbs` and `prnport.vbs` simplify the task of gathering information such as queue names, driver names, port names, and IP addresses from the old server. This information can be used later to create the new queues manually, or to automate the process by scripting. See [Automate the process through scripting](#) in this chapter for more information about automation and scripting.

Replace server, import drivers and queues from the old server

Run `PrintMig.exe` or `PrintBrm.exe` on old server.

Restore Print-Migrator image on new server.

If the test server requires the same configuration as the old server, the Microsoft tools `PrintMig.exe` or `PrintBrm.exe` can be used to import the configuration from the old server to the test server.

NOTE: Not all drivers are compatible with `PrintMig.exe`, so the error log must be inspected after the restore. The `PrintBrm.exe` tool is only available on later version Microsoft operating systems such as Windows 7 and Server 2008. `PrintBrm.exe` can import from a down level OS, but it might not be able to restore to a down level OS.

Verify existing driver compatibility with the latest UNIDRV and PSCRIPT versions.

HP does not recommend updating drivers on an operating production server. Besides the obvious interruption of printing while the drivers are being replaced, there are other unforeseen problems that can occur due to incompatibilities between versions of shared files currently on the system and the versions of the shared files about to be installed. See [Versioning of print driver shared files](#) in this appendix. If this is the only option, then HP recommends that a full backup of the server be made before any changes are done, so that in the event of a problem there is a fallback plan.

Client printing

This section applies to direct IP print deployments only.

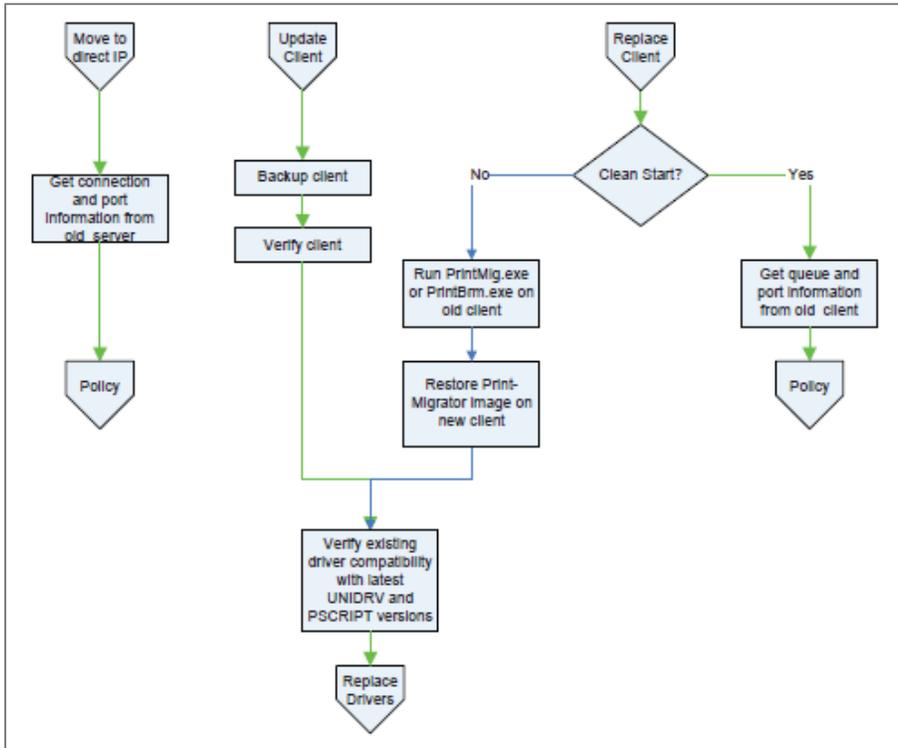


Figure F-3 Client printing

Replace client, clean start

Get queue and port information from old client.

The Microsoft tools `prnmngr.vbs` and `prnport.vbs` simplify the task of gathering information such as queue names, driver names, port names, and IP addresses from the old server. This information can be used later to create the new queues manually, or to automate the process by scripting. See [Automate the process through scripting](#) in this appendix for more information about automation and scripting.

Proceed to the section on [Policy](#).

Replace client, import drivers and queues from old client

Run `PrintMig.exe` or `PrintBrm.exe` on old client.

Restore Print-Migrator image on new client.

The Microsoft tools `PrintMig.exe` or `PrintBrm.exe` can be used to import the configuration from the old client to the test client.

NOTE: Not all drivers are compatible with `PrintMig.exe`, so the error log must be inspected after the restore. Also, the `PrintBrm.exe` tool is only available on later version Microsoft operating systems such as Windows 7 and Server 2008. `PrintBrm.exe` can import from a down level OS, but it might not be able to restore to a down level OS.

Update client

When updating a client, it is strongly advised to set up a test client and perform the initial upgrade and testing on the test client. See [Versioning of print driver shared files](#) in this appendix for more information on versioning print driver shared files.

Verify existing driver compatibility with latest UNIDRV and PSCRIPT versions.

Policy

This section applies to direct IP print deployments only.

Policy means choosing settings other than the HP UPD defaults and applying them during or after the deployment. These settings can include who can print in color, setting grayscale or duplex to be the default setting, or assigning printers to users based on department, floor, etc.

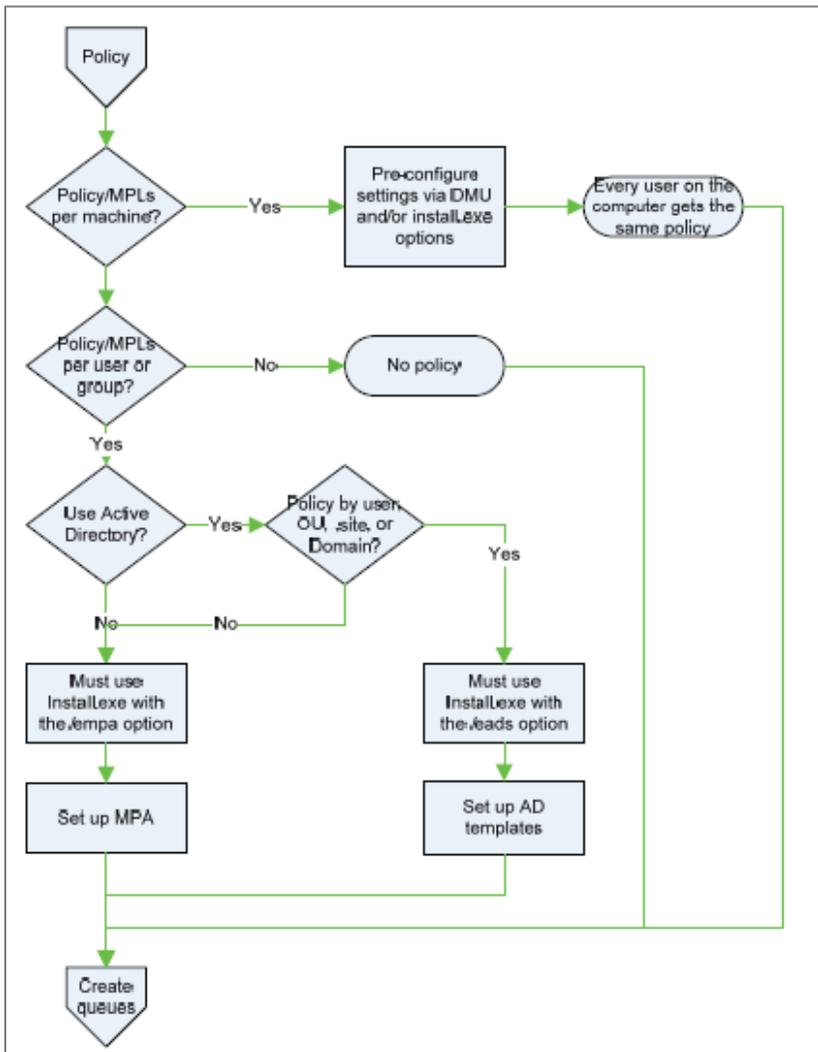


Figure F-4 Policy

Policy/MPLs per machine?

If an administrator wants to assign settings to one or more computers and wants the settings to apply to anyone that uses those computers, then the best way to set up those policies is to configure them at the time the driver is installed. If this is the case, refer to [Create queues](#).

Policy/MPLs per user or group?

If the administrator wants to assign settings or printers based on who is using the computer, the choice is whether to use Active Directory (AD).

Use Active Directory?

The decision to use Active Directory depends first on whether there is an Active Directory domain available, and the granularity of policy desired.

To set up Active Directory Policy, the administrator defines the policy settings in a Group Policy Object (GPO) and then assigns that GPO to the domain, site, one or more Organizational Units (OU) or users. Group Policy Objects cannot be assigned to security groups. If the administrator wants to set up domain wide or site wide policy with overrides for specific individuals, then AD is a viable choice. On the other hand, if the administrator wants finer grained policy than the OU structure can provide, the options are to restructure the AD structure.

Add/new queues

This section applies to both server deployments and direct IP print deployments.

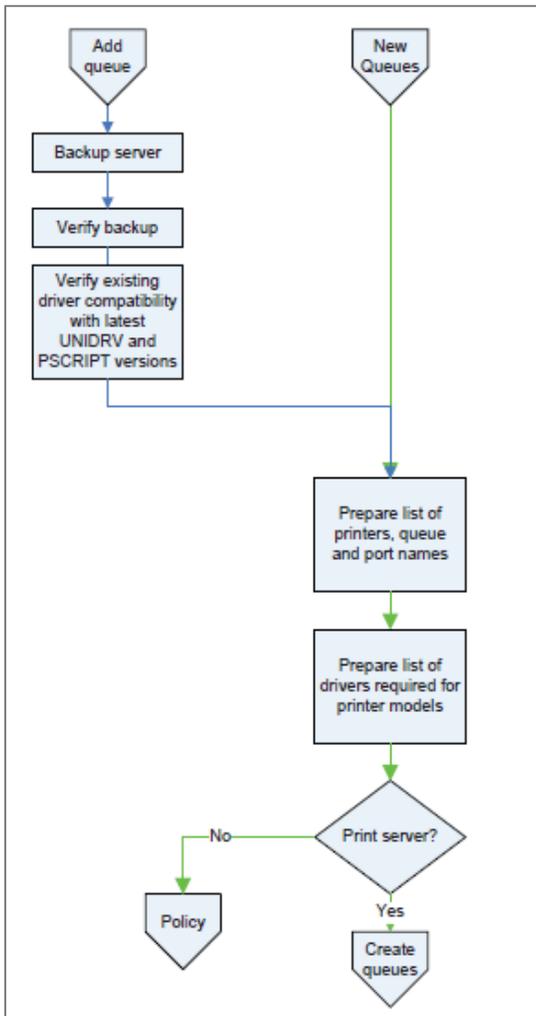


Figure F-5 Add queues

Add queues

When you add a new driver (HP UPD) and new print queues to an existing server, you might encounter change management issues similar to upgrading drivers. Besides the problems that can occur from increasing the load on an existing server, there can be unforeseen problems that occur due to incompatibles between versions of shared files currently on the system and the versions of the shared files about to be installed. See [Versioning of print driver shared files](#) in this appendix for more information on versioning print driver shared files. If this is the only option, then HP recommends that a full backup of the server be made before any changes are done, so that in the event of a problem there is a fallback plan.

New queues

Prepare list of printers, queue and port names, and port settings.

To create new queues on a new server or client, make a list of all the printers that are to be connected. Include the printer IP address or hostname. You might want to also decide on a printer naming convention, location information, and port name convention if you decide not to use default port naming.

Prepare list of drivers required for printer models.

Once you have a list of all the printers, the next step is to decide what drivers to use. For the most current list of HP UPD supported products, see the following Web site www.hp.com/go/upd. For those products that are not supported by the HP UPD, download the appropriate driver(s) from the manufacture's Web site.

Print server?

The HP UPD in the Direct IP print mode supports the application of policy in a user by user basis. If this type of configuration is desired, proceed to the [Policy](#) section.

If no per-user policy is desired, or if the HP UPD deployment is on a print server, proceed to [Create queues](#).

Create queues

This section applies to both server deployments and direct IP print deployments.

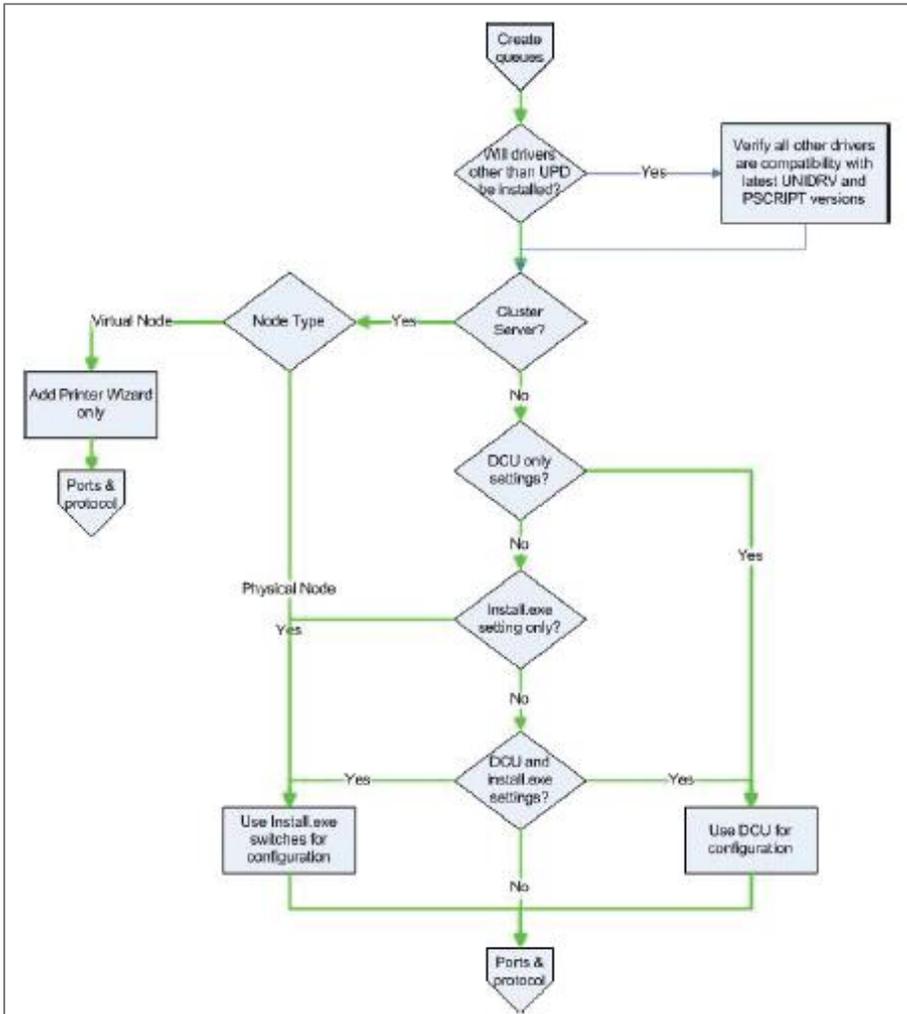


Figure F-6 Create queues

Will drivers other than the HP UPD be installed?

The HP UPD ships with a current version of the Microsoft UNIDRV and PSCRIPT5 files. If drivers other than the HP UPD will be installed, follow these steps to verify that all drivers you plan to install are compatible.

1. Verify the other drivers are compatible with the HP UPD provided unidrv/postscript version.
2. Verify the other drivers are compatible with Microsoft's latest unidrv/postscript version.
3. Verify the HP UPD is compatible with Microsoft's latest unidrv/postscript version.

Cluster Server?

In a Microsoft Cluster server environment there are significant restrictions placed on the installation and configuration of the HP UPD. Refer to [Environment A: Windows Cluster server environment](#) in chapter 5 for more information.

HP DCU only settings?

See HP DCU and INSTALL.EXE settings?

Install.exe setting only?

See HP DCU and INSTALL.EXE settings?

HP DCU and INSTALL.EXE settings?

The HP DCU is included with the HP Printer Administrators Resource Kit (HP PARK). To download the HP PARK, go to www.hp.com/go/upd and click **Download now**. Verify your language, and then click your operating system. Expand **Software – Universal Print Driver**. To the right of **HP Printer Administrator Resource Kit**, click **Download**. Save the file and then click the folder and click **Extract all files**.

The HP DCU is available for both 32-bit and 64-bit systems, and allows an administrator to pre-configure the HP UPD before installation. All of the queues created from this pre-configured driver have the same default settings. The HP UPD INSTALL.EXE utility also offers the administrator a number of configuration options. To get the list, run `install.exe /?` However, some of the options that are available from INSTALL.EXE are not available from HP DCU, and vice versa. Refer to [Table 4-1 Configurable functions and pre-configuration utilities](#) for specific details. If all the options you want are available from HP DCU, you can use HP DCU to pre-configure the driver and then use INSTALL.EXE, or the Add Printer Wizard, to install the driver and create print queues. Or you can use INSTALL.EXE alone if it has all the desired options.

Table F-1 HP DCU options

Features	Install	APW	APW cluster	HP DCU	AD
Alternate driver name	Y	Y	Y		
Alternate Job Delivery					Y
Color Access Control (CAC)					Y
Bidi enable and disable				Y	
Duplex		1		Y	Y
Dynamic mode	Y				
Economode		1		Y	Y
Edgeline Quality Access Control (QAC)					Y
Enable AD policy	Y				
Grayscale as default				Y	Y
Job tracking					Y
Private Printing / Job storage		1		Y	Y
Private Print default PIN				Y	Y
Restricted mode, MPL display only	Y				Y
Services Tab	Y	1		Y	Y
SNMP Community Name	Y3		2		
Managed Printer List	Y				Y

1 HP DCU can be used with INSTALL.EXE, or APW, and must be run on the driver first.

2 Option must be specified when INSTALL.EXE is run on all physical nodes.

3 These INSTALL.EXE options apply to all queues and all users. Otherwise, the settings apply only to the current user.

Notes

- HP DCU options apply to the driver and all print queues created with that driver.

- Only INSTALL.EXE and the Add Printer Wizard actually install the driver and create print queues. HP DCU is used to configure the driver prior to installation; AD configures the driver at print time.

Ports and protocols

This section applies to both server deployments and direct IP print deployments.

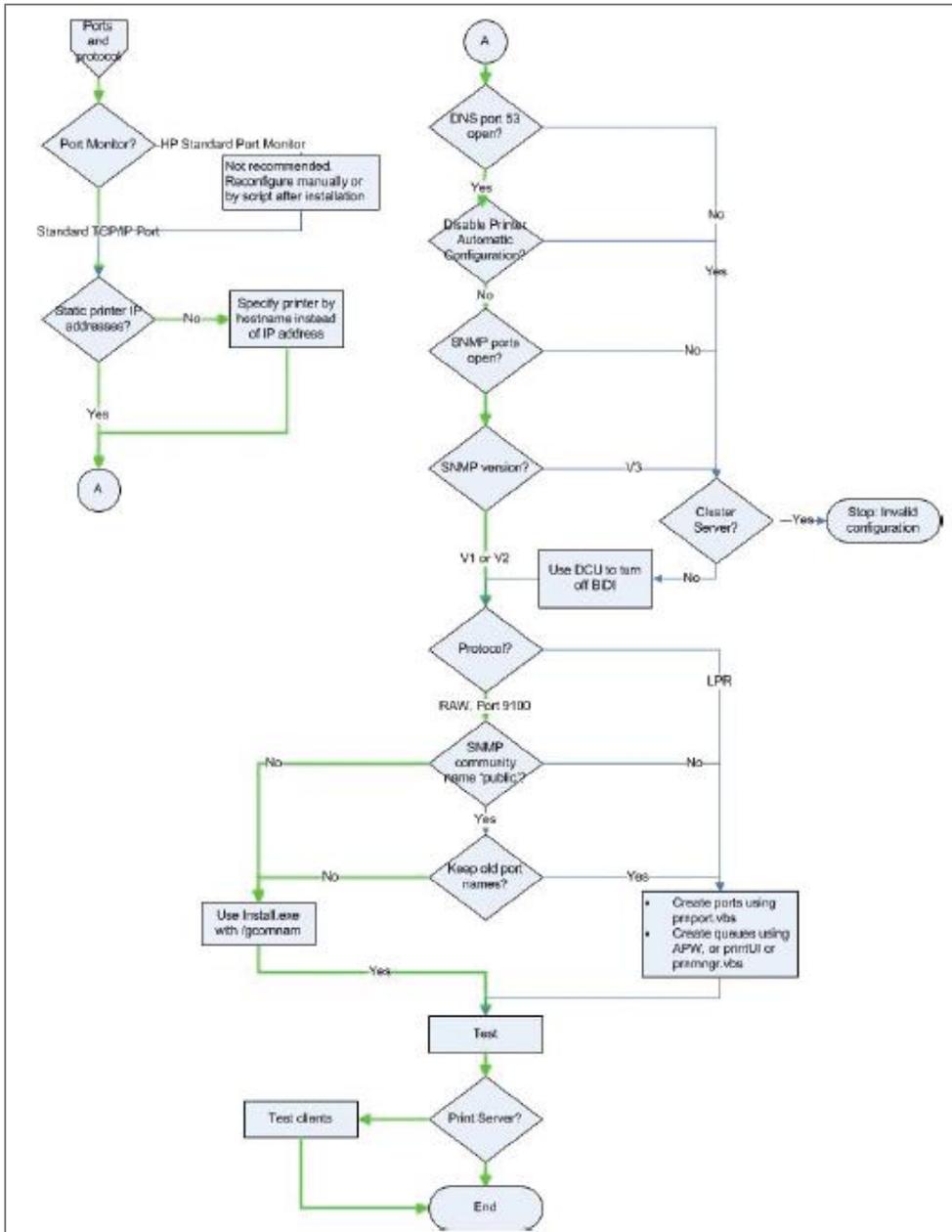


Figure F-7 Ports and protocols

Port Monitor?

By default, the HP UPD uses, and HP recommends the use of, the Microsoft supplied Standard TCP/IP port monitor for all network communications. If it is necessary to use the HP Standard Port Monitor, create and configure all the network ports before HP UPD print queue creation, or reconfigure the ports after installation.

Replace drivers

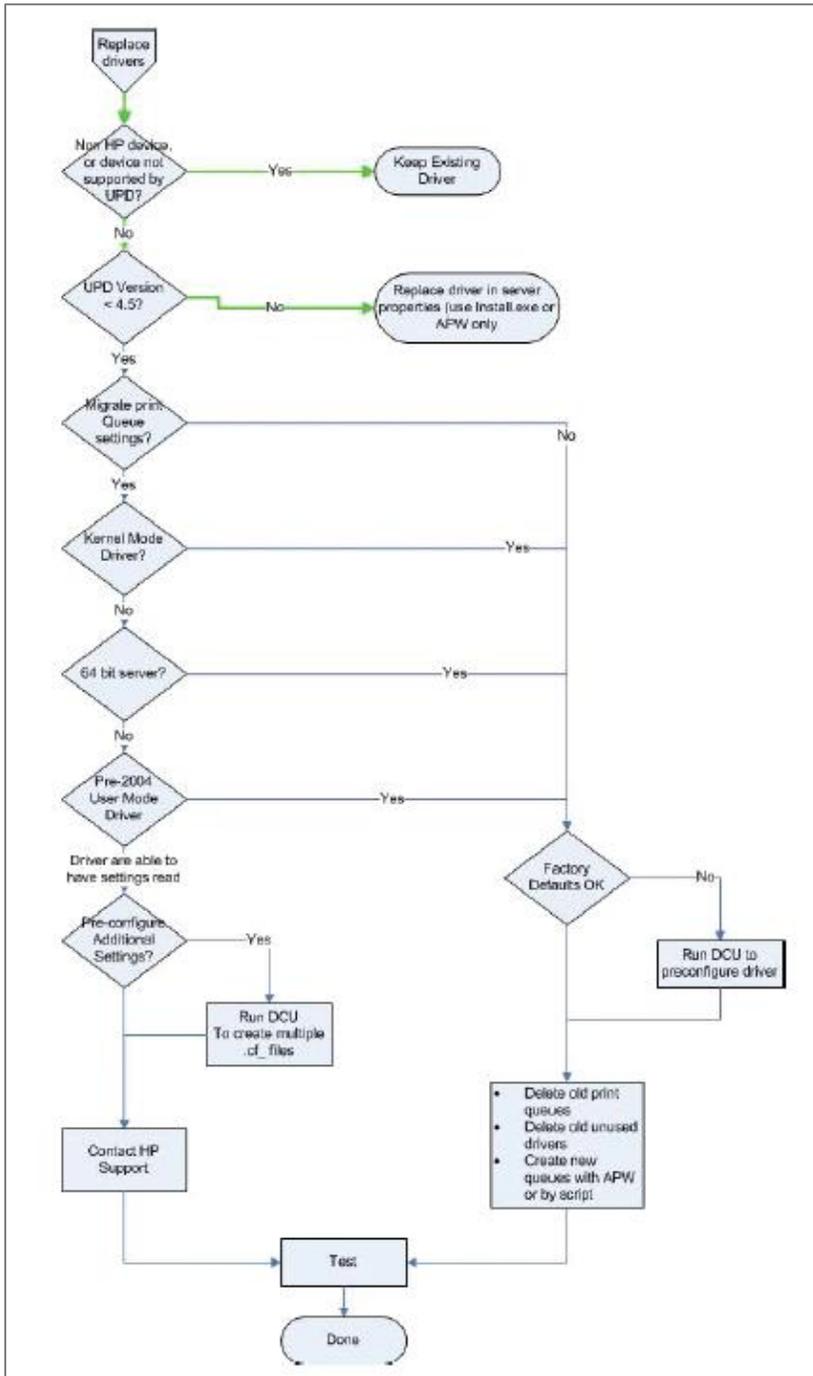


Figure F-8 Replace drivers

Versioning of print driver shared files

All of the files for all the printer drivers on Windows operating systems are located in one folder: %WINDIR%\system32\spool\drivers\, where <environment> can be W32X86 for 32-bit processors, x64 for 64-bit processors, etc.

The HP UPD consists of HP specific files and shared Microsoft files. The shared files are part of the UNIDRV or postscript architectures. These files are shared by other HP drivers, and printer drivers from other manufacturers. They can be upgraded at any time by installing a new print driver from HP or other manufacturer, or by installing a service pack, .NET framework, or hot fix from Microsoft. For that reason, it is important to know the current version of these files on your system, and if the installations of a driver, service pack, etc, will cause an upgrade. When an upgrade takes place, all drivers that use those shared files will be impacted, so steps must be taken to verify that all the drivers that use these shared files work with the latest versions. HP does not support upgrading from .5 to .6 versioning.

To determine the current version of these shared files, use the following methods.

1. Open the **Devices and Printers** folder, select a printer, click the **Print server properties** option, and then select the **Drivers** tab.
2. To get the currently installed version of UNIDRV.DLL or PSCRIPT5.DLL, select an HP PS or PCL 6 driver.
3. Click **Properties**.
4. Scroll down until you see driver file UNIDRV.DLL, or driver File PSCRIPT5.DLL and click **Properties**.
5. If UNIDRV.DLL or PSCRIPT5.DLL do not appear in the list, the driver you selected is an old, “monolithic” driver that does not use the shared Microsoft components. Select another driver and try again.
6. Select the **Details** tab.
7. In the **Property** column, see **File version**.

The problem described in this section is not unique to the HP UPD. It applies to all print drivers, including Product Specific drivers and drivers from competitors of HP. It applies to both monolithic and UNIDRV / postscript based drivers. The HP UPD, however, is the only driver that has the capability to efficiently address this problem.

In the enterprise, the goal is to standardize on a particular version of the driver, deploy it throughout the enterprise, and stay with that version until business need dictates the need to upgrade. However, due to many legitimate reasons, different versions of a particular driver will be deployed at any given time. It is in these situations that care must be taken in how the different versions are deployed to avoid potential problems and unwanted side effects.

Basic Printing

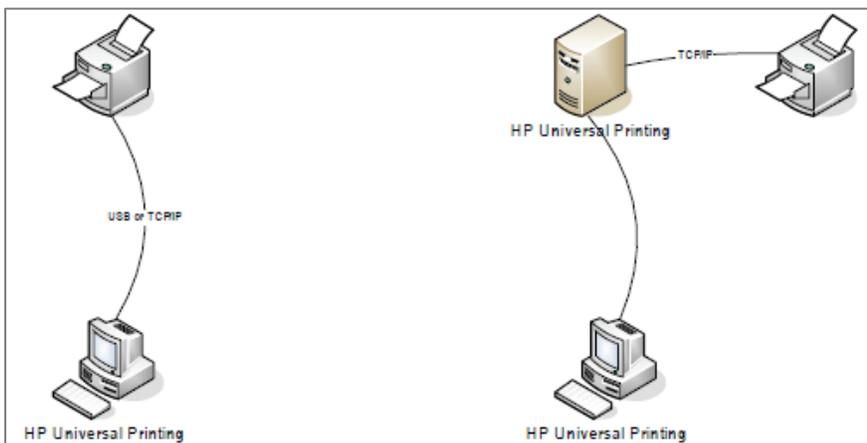


Figure F-9 Basic Printing

In both of the two topologies described in the diagram above, the version of the driver does not matter as long as it is compatible with the printing products. On the left, only one driver needs to be installed on the client in order to print to one or more products. On the right there is depicted a simple point and print configuration, in which only one driver needs to be vended down from the server to the client for printing. On a print server, HP recommends using the version specific name for the HP UPD.

Complex Print Environments

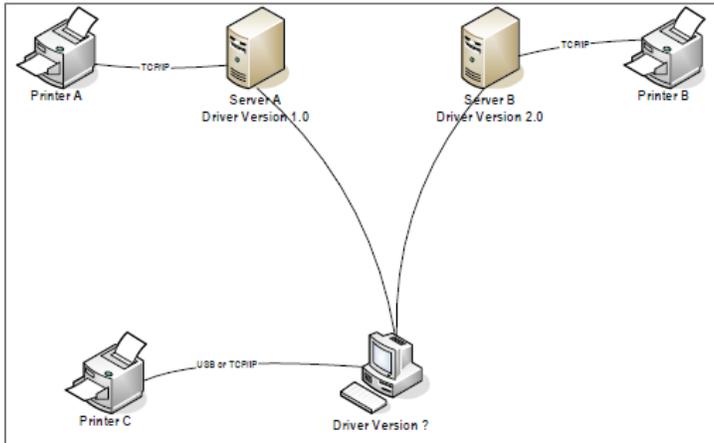


Figure F-10 Complex Print Environments

The diagram above depicts a more typical enterprise printing environment, where a client can be connected to more than one print server and might also have directly connected products. It is in these situations that careful driver version management is critical.

Consider the following scenario in the diagram above: The client first Plugs and Plays with printer C, causing the pre-loaded print driver v3.0 to be installed. Next, the client connects and prints to server A. Microsoft Point and Print recognizes that the driver version on the client (v3.0) does not match the driver version on the server (v1.0), so the server installs driver v1.0 on the client.

Then the client connects to and prints to server B. Again Point and Print recognizes the driver version difference and installs driver v2.0 onto the client.

The net result is that every time the client switches from one print server to another, a driver installation takes place. For the client Plug and Play connection to printer C, the driver is also changed from the original v3.0 to either v1.0 or v2.0.

Solution

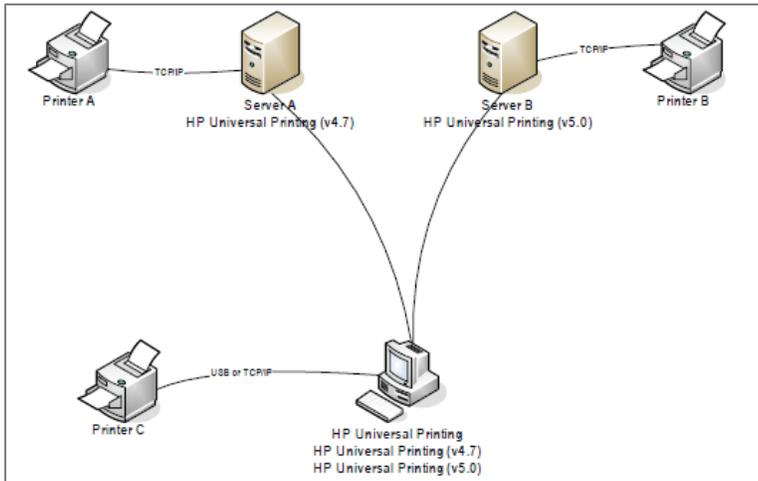


Figure F-11 Solution

There are two solutions to this problem: One is to make sure that every client and every server in the enterprise is using the same version of driver. However, given the size of most networks, this solution is impractical. The other is to use the version management feature of the HP UPD.

Starting with v4.7, HP UPD has the ability to be installed either using a generic name, (HP Universal Printing), or a version specific name, (HP Universal Printing (v4.7)). The recommended practice is to install HP UPD on servers using the version specific name. The diagram above describes this. Printer C Plugs and Plays with the driver named HP Universal Printing. This driver can be v4.7, v5.x, or even v4.5. Server A downloads HP Universal Printing (v4.7) and Server B downloads HP Universal Printing (v5.0). The net result is that there are now 3 drivers installed on the client, and no unintended driver upgrades/downgrades taking place.

When Server A is upgraded to HP UPD 5.X, it will see that HP UPD v5.x is already installed on the client (from the connection to Server B) and use it.

Automate the process through scripting

Get queue and port information from old server or client

The Microsoft tools `prnmngr.vbs` and `prnport.vbs` can simplify the task of gathering information such as queue names, driver names, port names, IP addresses, etc. from the old server. This information can be used later to create the new queues either manually or to automate the process by scripting.

Creating print queues and ports

The Microsoft tools `prnport.vbs`, `prnmngr.vbs` and `printUI.dll` can simplify the task of creating print queues and printer ports.

Other scripting examples

There is a wealth of information and scripting examples available in the Microsoft Script Repository: Printing on the Microsoft Web site at gallery.technet.microsoft.com/scriptcenter.

G Support information to collect

Introduction

Efficient troubleshooting leading to issue resolution requires collection of basic and extended information related to the reported incident. Use this worksheet as the first step to contacting technical support.

This appendix contains the following sections:

- **Symptoms**
- **Print driver**
- **Environment specifications**
- **Printer information**
- **Application**
- **Files to collect**

Symptoms

- 1 What is the reported issue?
- 2 What are the symptoms?
- 3 Location of the issue (client, server, printer)?
- 4 Provide error messages and location source?
- 5 How often does problem occur?
- 6 Exact steps that produced the reported issue?

Print driver

Determine the HP UPD driver version

1. In the **Printers** folder, right-click the HP UPD driver/queue and then select **Printer properties**.
 - For a traditional mode installation, select the **About** tab. The version displays at the top.
 - For a dynamic mode installation, the version displays on the lower left.
2. Test the latest version of the HP UPD available from www.hp.com/go/upd.

Does the error occur with the latest version of the driver from hp.com?

Determine the installation details

1. What is the printer description language, PS or PCL 6?
2. Is this a new installation of the HP UPD, or an upgrade of an existing HP UPD installation?
3. Is the installation of the HP UPD onto the server, the print client, or vended from print server to client (PnP)?
4. What is the method of installation? Does each method produce the same result?
 - Add Printer Wizard
 - INSTALL.EXE
 - Dynamic mode or traditional mode?
 - Optional switches?
 - Point and Print vended from Microsoft Print Server
 - Other
 - **Printers** folder- **Printer properties** - **Advanced** - **New Driver**
 - **Printers** folder- **Server Properties**- **Drivers** tab - **Add or Reinstall**
 - Custom printUI.dll.
5. Determine which port is in use (TCP, USB, etc.). Open the **Printers** folder, right-click the printer name, select **Printer properties** and then click the **Ports** tab. Which **Port** is selected? What settings are defined, if applicable, for the port (select **Configure Port**)?
6. Determine which print processor is in use. Open the **Printers** folder, right-click the printer name, select **Printer properties**, select the **Advanced** tab, and then click the **Print Processor** button. Which **Print processor** is highlighted/selected?
7. Was the driver pre-configured before the HP UPD installation?
 - a. **HP Driver Configuration Utility**. What settings were altered compared to the HP default *.cfg.
 - b. **HP Driver Deployment Utility**. What settings were altered compared to the HP default.

Is Printer Automatic Configuration enabled (default)?

Printer Properties→Device Settings tab→Installable Options→Automatic Configuration→Update Now.

What is the “Configuration Status” provided on the About tab?

Printer Properties→About, see “Configuration Status.”

Management Tools

1. **Driver Configuration Utility version?** Select **Help | About** in the HP Driver Configuration Utility.
2. **AD Template?** Version is part of the template’s file name.
3. **HP DDU version?** Select the **About** button.

Environment specifications

Version of Microsoft operating system (print server and print client)

To obtain system information, use any of the following methods.

- Brief—click **Start**, click **Run**, and then type WINVER.EXE
- Extended—click **Start**, click **Run**, and then type cmd.exe to open the command prompt dialog box. Type /k systeminfo.exe at the command prompt.
- Complete—click **Start**, click **Run**, and then type MSINFO32.

Microsoft Event log (spooler errors, etc)?

Click **Start**, click **Run**, and then type Eventvwr.msc.

Printer connectivity

1. Is the printer direct connected? If so, how is it connected, USB or Parallel?
2. Network and connectivity settings
 - a. IP addresses
 - 1 Printer server
 - 2 Print client
 - 3 Print product
 - b. Print path network availability (client/server/printer). Execute the following commands:
 - 1 ping ip_address
 - 2 telnet ip_address
 - 3 Tracert ip_address
 - 4 http://device_ip_address
https://device_ip_address
 - c. Is SNMP enabled?
 - 1 Is it able to be routed in your network?
 - 2 SNMP Community Name. prnport -l

Citrix

1. Server—Citrix server version
2. Client—operating system and Citrix client version
2. Auto created printers configuration
 - a. Client printers or session printers?
 - b. If client printers, what driver is mapped to the client for auto-creation (Citrix UPD; HP UPD; HP model specific driver)?

Microsoft Terminal Services

1. Version of the Terminal Server.
2. RDP client version.
3. Operating system version of client.
4. What driver is mapped to be redirected to the printer?
5. Does the same issue exist outside of a Terminal Server session?

Novell

1. Version of Novell print server.
2. Installation method of print queue on server (i.e.- iManager).
3. Version of iPrint client.
4. Does same issue exist printing to a non-Novell print queue?

Printer information

1. Printer model name
2. Printer model firmware. Methods to obtain:
 - Printer control panel (print a configuration page).
 - HP Embedded Web Server (http://ip_of_print_device). See Device Configuration “Firmware Datecode.”
 - HP Web Jetadmin.
3. Error information displayed or printed out from the product
 - a. Error message content
 - b. Event log
 - Displayed from the control panel or HP Embedded Web Server.
 - Printed on the configuration page (last 3 items).
 - Printed from the control panel or HP Embedded Web Server (entire log).
4. Device configuration page. The product configuration can be obtained by using either of the following methods.
 - Printing at the printer control panel.
 - By printing a test page. Open the Printers folder, right-click the printer name, select **Printer properties**, and then click the **Print Test Page** button.

Application

- Application(s) affected and application version number. Open the **Help** menu in the application and select **About** to find the application version number.
- Test documents specific to reproducing the issue.

Files to collect

The following list contains information that might be requested to continue troubleshooting for the purpose of debugging, analyzing and creating reproducible test cases.

1. MSINFO32: Click **Start**, click **Run**, and then type MSINFO32.exe. Save the *.NFO file to disk.
2. System Information: From a command prompt, pipe the output to file: C:\>systeminfo.exe >systeminfo.txt.
3. Microsoft Support Diagnostics Toolkit (MSDT): For details and information refer to Microsoft Support Diagnostics Self-Help Portal: <https://home.diagnostics.support.microsoft.com/SelfHelp>
4. Microsoft Event Viewer Logs: Click **Start**, click **Run**, and then type Eventvwr.msc. Select the tree node, and from the Action menu select **Save Log File As...** to save the log file.
5. PRN file: Application dependent. Example: Click **Start**, click **Run**, and then type WRITE.EXE, select **File** and then **Print**, select **Print To File** and save to FILENAME.PRN
6. Application file: Provide a sample file from the application which created the reported issue.
7. Print a test page: Open the Printers folder, right-click the printer name, select **Printer properties**, and then click the **Print Test Page** button. Scan the output page to a distributable computer file format. Options to create the page include the following.
 - Device Configuration Page: Print from the printer control panel.
 - Printers folder→**Printer properties**→**Print Test Page**.
5. Scan of printed document: After printing a page, use a colored pen to mark up and identify the issue with the printed output. Scan the marked up page back to a distributable computer file format.
6. Driver Configuration Utility (HP DCU): Provide the pre-configuration files *.cfg or *.cfm
7. Device Network Settings: Methods available to capture information
 - Telnet to the product, output all information to console, select upper left icon and right mouse, EDIT-SELECT-ALL. Repeat right mouse, EDIT-COPY. Paste into file and save.
 - Use HP Web Jetadmin views to create an export file
 - HP Embedded Web Server to printer: http://ip_of_printdevice
8. Screen shots: Error dialogs, user interface, etc.
9. Microsoft crash dump file
 - **Server 2008:** support.microsoft.com/kb/254649 (dump files, when enabled, are stored by default in %SystemRoot%\Minidump folder).
 - **Windows 7:** support.microsoft.com/kb/931673 (dump files, when enabled, are stored by default in Drive:\Users\UserName\AppData\Local\Temp)

NOTE: If a process hangs or is very slow, starting with Windows 7, the task manager has the ability to take a process memory dump file that can be useful to the lab to determine what the system is doing or waiting for. To create a dump file:

1. Start Task manager
 2. Go to the processes tab.
 3. Select the process that is hanging. A good place to start is spoolsv.exe
 4. Right click, and select Create Dump File.
 5. Make a note of the location where the system stored the dump file. The location is not user selectable.
-

10. Directory file listing:

```
C:\>DIR %SYSTEMROOT\system32\spool\drivers /s >C:\w32x86.tx
```

11. SetupAPI.log: Located in %SYSTEMROOT%

12. Screen shots: Error dialogs, user interface, etc.

13. Registry exports (three targets)

```
regedit.exe /e c:\updreg1.txt
```

```
"HKEY_LOCAL_MACHINE\SOFTWARE\Hewlett-Packard\HP Print Settings"
```

```
"HKEY_LOCAL_MACHINE\SOFTWARE\Hewlett-Packard\HP SSNP"
```

```
"HKEY_CURRENT_USER\Software\Hewlett-Packard\HP Print Settings"
```

H Glossary of terms

Term	Definition as related to the HP UPD
Bidirectional Communication (bidi)	See printer automatic configuration
hpcpuXXX.cf_ file	Driver Configuration Utility file used for pre-configuration of the HP UPD driver
hpcpuXXX.cfm file	Driver Configuration Utility file used for pre-configuration of the HP UPD driver
Capabilities mode	Capabilities mode is a generic term to describe how settings are shared between the firmware and driver. Starting in UPD HP UPD 6.4.1, firmware on supported devices can share the capabilities of the device and input/output devices with the HP UPD to configure settings directly in the HP UPD.
Device	The physical output device at the end of the print connection (i.e. a printer or MFP).
Device mode	Device mode is a generic term to describe how settings are shared between the firmware and driver. Device mode is how prior releases of the firmware shared device information with HP UPD such as part numbers and model numbers with the HP UPD mapping the device information to settings in the driver.
Driver Deployment Utility (HP DDU)	Enables print administrators to create driver packages that include the print driver files and code needed for deployment to run on a client computer.
Product-specific driver	The driver is specific to a particular model of print product and not universal.
Driver Configuration Utility (HP DCU)	Used to edit the configuration file associated with a particular driver. The configuration file controls the print driver settings and takes effect when the driver is installed.
DOT4	DOT4 is based on the IEEE 1284.4 protocol that allows a multi-communication through single port; often associated with USB ports.
Driver Name	<p>By default, the HP UPD installation sets the printer name to match the driver name for the first installed printer. The driver name is defined by the vendor and read by the Microsoft operating system from the driver's *.INF file. To view the "Driver" name, from the Printer's folder, select an installed printer, right mouse click and select Properties or Printer Properties, go to the Advanced Tab, and locate the field name "Driver."</p> <p>During the HP UPD installation using Add Printer Wizard, the option exists to install the HP UPD as either non-version specific or version specific. Selecting either option provides the same set of driver features.</p> <p>The version specific option allows installation of two or more HP UPD driver versions on to the same system. The HP UPD version-specific driver name examples:</p> <p>HP Universal Printing PCL 6 (v6.3.0)</p> <p>HP Universal Printing PCL 6 (v6.1.0)</p> <p>HP Universal Printing PS (v6.0.0)</p> <p>With the non-version specific option, all printer names will use the same driver version of the installed HP UPD. The HP UPD non-version-specific driver names are defined below:</p>

Term	Definition as related to the HP UPD
	<p>HP Universal Printing PCL 6</p> <p>HP Universal Printing PS</p> <p>As a best practice, HP recommends installing the HP UPD in version specific mode to best support control of driver version upgrades, and new product introductions. This benefit allows multiple versions of the HP UPD to be installed onto the same system. Administrators can create new print queues for new print products without the need to recertify/retest existing deployed products to the new driver version.</p> <p>Version specific and non-version specific HP UPD installations can exist on the same system. The same HP UPD version can be installed two times onto the same system using the HP UPD version specific install, followed by the HP UPD non-version specific install option. The result is two different driver names, both using the same driver version.</p> <p>HP Universal Printing PCL 6</p> <p>HP Universal Printing PCL 6 (v6.3.0)</p>
Driver Store	After a print driver has been installed onto the system, the print driver is added to the Windows driver store. The driver store facilitates installation of a new printer without requiring the user to specify the driver file location using "Browse" , "Have Disk" or other Microsoft supported methods.
Duplex	Printing on both sides of a single sheet; opposite of the terms Simplex or Single Side.
Dynamic mode	Selected during installation of the HP UPD and opposite of traditional mode. Dynamic mode locates network printers within your subnet or by providing the printer name or address on any subnet of the network. Dynamic mode is not directly tied to one product connection.
Enterprise Auto Configuration (EAC)	See printer automatic configuration.
HP Embedded Web Server (EWS)	HP Embedded Web Server in the HP printing product accessible by a browser over HTTPS that allows status and configuration access to the product.
Graphics Device Interface (GDI)	The Microsoft® Windows® graphics device interface (GDI) enables applications to use graphics and formatted text on both the video display and the printer. Windows-based applications do not gain access to the graphics hardware directly. Instead, GDI interacts with product drivers on behalf of applications. msdn.microsoft.com/en-us/library/dd145203(VS.85).aspx
Generic Printer Description (GPD)	Microsoft's Generic Printer Description that uses Microsoft Unidrv architecture to present printer features in the user interface allowing configuration of the printer. The GPD also contains the commands that allow UNIDRV to generate printer data for output from Windows based applications.
Group Policy Management Console (GPMC)	Microsoft tool used for management of group policy objects in an Active Directory.
hpcuXYZc.inf	Driver information file for HP UPD 32 Bit PCL 6
hpcuXYZd.inf	Driver information file for HP UPD 32 Bit PS
hpcuXYZu.inf	Driver information file for HP UPD 64 Bit PCL 6
hpcuXYZv.inf	Driver information file for HP UPD 64 Bit PS
In Box Driver	HP provided print drivers distributed with the Microsoft operating system.
[filename].inf	Driver information file designed within required Microsoft operating system specifications used during installation of the Windows print driver. msdn.microsoft.com/en-us/library/ff560914.aspx
Job Capability Ticket (JCT)	A file that defines specifications for the target product.
LEDm	Low End Device Model

Term	Definition as related to the HP UPD
Multicast Domain Name Service (mDNS)	Multicast DNS (aka Zeroconf, aka Apple Rendezvous, aka Apple Bonjour), effectively allowing name resolution by common Unix®/Linux programs in the ad-hoc mDNS domain.local. Used by the HP UPD to discover printers in dynamic mode and by the Managed Print Administrator tool.
HP Managed Print Administrator (HP MPA)	Separate standalone utility used for managing HP UPD policies and created printer lists (no longer supported).
Managed Printer List (MPL)	Printer list created within HP MPA for printer discovery in HP UPD dynamic mode.
Manage Print Policy (MPP)	Created in HP MPA, user based policies that control HP UPD functionality.
Model	Windows XP, Windows Server 2008, and Windows Vista printer folders display a "Model" field for installed printer names. The "Model" field is the same as the "Driver" name assigned to the printer. Starting with Windows 7 and Windows Server 2008R2, Microsoft removed the "Model" field from display within the Printer's folder and Print Management Console.
Net Driver HPZ12 service	HP UPD installed service that provides bi-directional I/O for the HP UPD, outside the context of the user, application, or print job.
PCL	Printer Control Language
PML Driver HPZ12 service	HP UPD installed service that provides bi-directional I/O for the HP UPD outside the context of the user, application, or print job.
PNG Portable Network Graphics	PnP Point and Print. Context dependent, sometimes used to refer to as Plug and Play.
Port Monitor	The port monitor uses Simple Network Management Protocol (SNMP) to read the configuration of the target print product and to determine the product's detailed status.
PPD	Postscript Printer Description
Printer automatic configuration	Executed at installation or using the feature Update Now within the HP UPD driver user interface from the Device Settings tab. The HP UPD will communicate with the device to retrieve device capabilities directly from the device. Information passed between the device and HP UPD can be in the form of a Job Capability Ticket over HTTP, SNMP response over the HP UPD, Dot4 or LEDM.
Printers Folder	The Windows folder that contains a listing of all installed printers, providing access to administrator functions to define a printer's settings, install new printers, or delete installed printers. Printer objects (printer names) exist in the Printers folder, which are also accessible from the Microsoft Print Management Console (PMC).
Printer (Print Name, Printer Object)	An arbitrary name assigned to identify a print queue; also known as the printer object. During an application FILE-Print operation, end users select the printer name to define the output device for their print job. By default, the HP UPD install sets the HP UPD printer name to be the same as the driver name. For example, the printer name would be "HP Universal Printing PCL 6." If the UPD version specific install method is selected, the printer name would be "HP Universal Printing PCL 6 (v6.3.0)." For any installed printer, the Microsoft default printer will have a check mark next to the printer's "Name."
Print Queue	The print queue refers to an instance of an installed printer name with a driver name and printer port assigned. The terms Print Queue and Printer are often used interchangeably.
PSCRIPT5.DLL	Microsoft postscript specific print driver file used for Universal Print driver functionality.
SAG	System Administrator's Guide
Share Name	An installed printer name that is shared on the network for connecting clients for Point and Print connectivity.
Simplex	Single sided printing, opposite of the term duplex.
SNP	Status Notification Pop-up.
Traditional Mode/Static Mode	Selected at the time of HP UPD installation and opposite of dynamic mode, traditional mode (sometimes referred to as Static mode) behaves like a product-specific driver. During installation, the driver is associated with a specific printer, creating a permanent instance of the driver.

Term	Definition as related to the HP UPD
Unidrv	The Universal Print Driver (Unidrv) is the Microsoft Corporation's standard print driver for non-PostScript printers
UPD Version	A product version number assigned to each release of the HP Universal Print Driver. Examples include version number 5.9.0, 6.1.0, 6.3.0.
UPD Version Specific	HP installed universal print driver that contains the HP UPD's release version as part of the "Driver" name string. For example, "HP Universal Printing PCL 6 (v6.3.0)". Using the version specific driver name allows more than one version of the HP UPD to be installed onto the same system. The features of the driver are the same as the HP UPD Non-Version Specific.
UPD Non-Version Specific	HP installed universal print driver that does not contain the HP UPD's release version as part of the driver name string. For example, "HP Universal Printing PCL 6". The features of the driver are the same as the HP UPD Version Specific.
Update Now	See Printer automatic configuration
WHQL	<p>Windows Hardware Quality Lab is a testing process required to receive the "Certified for Windows" logotype. This certifies the HP UPD driver has completed testing by Microsoft before HP released the driver. Drivers that do not have WHQL certification at time of installation will prompt "The software you are installing for this hardware [DEVICE] has not passed Windows Logo testing... Continue Anyway / Stop Installation."</p> <p>On Windows 8/8.1 64-bit and later Windows operating systems, the user gets the error "Printer was not installed". If you need to install a non-WHQL'd driver, you will need to reboot selecting F8 to go into a troubleshooting mode, select Disable Driver Signature Enforcement and then install the driver. After installing, you will need to reboot again to get out of the troubleshooting mode.</p>
WJA	HP Web Jetadmin software is a print and imaging peripheral management software tool that helps optimize product utilization, control color costs, secure products, and streamline supplies management by enabling remote configuration, proactive monitoring, security, troubleshooting, and reporting of printing and imaging products.

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