Universal Printer Description Format
Software Requirements Specification

Revision History

Date	Version	Who	Description of changes
Aug 17, 1998	0.01	Sandra Matts	Initial version
Aug 24, 1998	0.02	Sandra Matts	Changes as a result of UPD meeting
September 16, 1998	0.03	Sandra Matts	Formatted to IEEE 830 template
November 12, 1998	0.04	Sandra Matts	Enhanced descriptions in requirements
January 18, 1999	0.05	Harry Lewis, Sandra Matts,	Changes from UPDF meeting.

Template: IEEE Std 830-1993 - Recommended Practice for Software Requirements Specifications 830 and IEEE 1233 - Guide for Developing System Requirements Specifications.

Table of Contents

1. Introduction

1.1 Purpose

The purpose of this document is to specify the properties and requirements of the Universal Printer Description File Format. Chartered under the Printer Working Group.

1.2 Scope

In operating systems, printers are supported through systems level programs called printer drivers. The scope of this document encompasses the operating system, the printer driver, and the printer device.
(Windows, OS/2, Unix, Apple and other high level description of printer driver and relation to OS here).
Also a high level description of Unix since it is different than Windows.
The scope may also encompass the definition of an (XML based) meta-language to address UPDF retrieval assuming the device has already been discovered..
This requirements document describes the requirements for the UPD Charter.
. However an implementers guide will be written to describe various methods of UPDF installation, retrieval, and usage. How will the dynamic nature of discovery be defined in the UPDF.
Out of Scope for UPDF is

- Printer marking language. Too large an undertaking for current project. May look at in the future.
- Job ticket. IPP, Apple, and Adobe all have the notion of job tickets.
- UPDF creation, test and/or compliance tools or test suites.
- Security
- Job Monitor

Note: There may be areas of overlap with IPP Printer Capabilities (i.e. Job Ticket) which we will want to reconcile and/or harmonize. Further investigation required.

1.3 Definitions, Acronyms, and Abbreviations

OS	Operating System
PDL	Page Description Language
PWG	Printer Working Group
UPD	Universal Printer Driver
UPDF	Universal Printer Description Format
Printer	Standalone device or printing part of a MFP device

1.4 References

Printer Working Group: web page is at www.pwg.org. PWG is an organization of printer manufacture companies, operating system vendors, printer peripherals, and printer software companies. The PWG is a working group of the Internet Engineering Task Force (IETF) that is responsible for defining standards related to printing.
Charter Proposal for Universal Printer Description File: ftp://ftp.pwg.org/pub/pwg/upd/archive/updchrtr.pdf
IPP Protocol: Internet Printing Protocol is almost a standard protocol to cover printing on the Internet.
Unicode Standard: web page is at www.unicode.org. Unicode is a standard for specifying characters for computers for many languages. The latest version is 2.1, which defines 38,887 distinct coded characters from 25 world scripts. The Unicode Standard 2.0 ISBN 0-201-48345-9
Windows DDK: Windows Device Driver Kit is a software package needed to write device drivers in the Windows OS. DDK software for the various flavors of Windows is at www.microsoft.com/??
Other OS Driver development docs

1.5 Overview

2. General Description

2.1 Product Perspective

2.1.1 System Interfaces

The UPDF is intended to be located in several areas.

1. In the operating system or on a printer cdrom that ships with the printer. This is the traditional or current method of driver distribution.
2. In the printer memory. Method of transmission is that the operating has to communicate with the printer device and pull the UPDF file from the printer and then parse the UPDF in order to configure a printer driver.
3. Possibly pull the entire UPDF or sections of the UDPF from a web site. For example, UPDF may be stored at the www.hp.com/support.

Operating systems interface with the UPDF through the printer driver in Windows. In Unix???
Printer Driver interfaces with the UPDF in several different aspects. It must parse the UPDF and display UI, be able to get and display any custom UI, it has to be able to parse and get additional information about the printer for dynamic configuration, it has to be able to perform versioning of the UPDF during dynamic discovery.

2.1.2 User Interfaces

There are three categories of users for the UPDF. The first is the developer who will create a UPDF to describe a printer device.
End user of printer driver
Developer of UPDF for printer support. Developer of UPDF printer driver to parse the UPDF and configure a printer driver based on information conveyed from UPDF.

2.1.3 Hardware Interfaces

The UPDF is intended to be platform independent. Therefor no specific hardware is excluded. Intended hardware is … if binary data is in the UPDF that it be expressed in a processor independent fashion.

2.1.4 Software Interfaces

The UPDF is intended to be operating system independent. Therefore no specific operating system is excluded.

2.1.5 Communication Interfaces

Network protocols; I/O protocols
There are a couple of different retrieval paths for UPDF. It can be in the printer memory, on a web site, in the OS, or on an install disk.

2.1.6 Memory Constraints

Limits on memory.

Embedded OS up to a mainframe. Works on printers from "$99" printer up to large devices.
If the UPDF is stored in the printer memory could be an issue. UPDF cannot be a heavy or thick specification. There will have to be required entries and optional entries. A more complex printer generally will have enough memory for a UPDF with more optional entries.

2.2 Product Functions

2.3 User Characteristics

There are two users of the Universal Printer Driver. The first user is the developer who is responsible for creating the UPDFs in order to support a printer in an O.S. Also the developer will have to create a Universal Printer Driver that can use the UPDF. The second is the end user who will print a document using an application in the target O.S.

2.4 Constraints

General description that will limit the developer's options

2.5 Assumptions and Dependencies

UPDF format will be specified at a later time.

2.6 Apportioning of Requirements

This subsection of the SRS should identify requirements that may be delayed until future versions of the system.
1. MFPs are one class of device, which may result in further extensions of UPDF at a later time.

3. Specific Requirements

3.1 External Requirements

Related projects within the PWG include Internet Printing Protocol (IPP) and Server to Device Protocol (SDP.)
Unicode Standard

3.2 Functional Requirements

1. Printer			Requirement Fulfilled	Priority
	PDL Independent		1.1	
	Hardware Independent		1.2	
	Color Management System		1.3	
	Localizable User Interface		1.4	
	Localizable Feature Set		1.5	
	Rendering		1.6	

	User Interface		1.7	
	Paper Handling		1.8	
		Finishing Devices and Capabilities	1.8.1	
		Input / Output Device	1.8.2	

		Output Device		
2. OS / Host				
	Color Management System		2.1	
	Rendering		2.2	
3. Resources			3	
4. Fonts				
	Device Fonts		4.1	
	OS Fonts		4.2	
	Font Substitution		4.3	
	Character set support		4.4	
	Unicode		4.5	
5. Overlays			5	
6. Forms			6	
7. Communication				
	Protocol independent		7.1	
	Bi-directional		7.2	
	Unidirectional		7.3	
8. Version				
	UPDF Version		8.1	
	Job instance version		8.2	
9. Global System				
	Localizable UI		9.1	
	Multiple levels of include		9.x	High Want
	Resources			
	Localizable feature set		9.2	
	Extensible			
		Render	9.3.1	
		Fonts	9.3.2	
		Color	9.3.3	
		OS Independent callbacks (ex. JAVA)	9.3.4	
		Vendor unique UPDF description formats	9.3.5	
		Backward compatibility	9.3.6	High Want
	UI		9.4	
		Edit Text Entry	9.4.1	High Want
		File Picker	9.4.2	Want
		Editable Combo Box/Drop down box	9.4.3	Want
		Able to logically group the user interface Item	9.4.4	High Want
	Paper Handling		9.5	
	Finishing		9.6	
10. UPDF				
	Component construction and retrieval		10.1	

	Separation of PDL specification vs. device capabilities		10.2	High Want
	Priority and precedence of redundant UPDF components		10.3	

SRS	
1.1	The UPDF cannot be aligned with any particular PDL. It has to be able to be used on low level raster devices and on devices that understand high-level printer languages.
1.2	
1.3	
1.4	
1.5	
1.6	
1.7	
1.8	
1.8.1	
1.8.2	
2.1	
2.2	
3	
4.1	
4.2	
4.3	
4.4	
4.5	
5	
6	
7.1	Consider defining a meta-language for communication.
7.2	
7.3	
8.1	
8.2	
9.1	
9.x	**Purpose:** Allow the developer or user to include a file and the file has another include statement to include another file. The PPD specification has defined this topic but the implementation is very limited or not exists. Examples of using this feature are including a language header, including a common PPD header.
9.2	
9.3	Extensions 1) Extensions that embrace things we could not foresee. The spec will allow for the future with the intent that the extensions will be folded into the main spec in future versions. These are generic extensions

	2) Extensions that allow printer vendors to add value and differentiate themselves in the marketplace. This is within the scope of the charter as long as the base UPDF provides good printing on all operating systems. These are vendor specific. They will probably will get folded back into the specification at a later time. 3) OS specific extensions. These extensions are expressly forbidden by the charter.
9.3.1	**Purpose:** Allow printer vendor specific extensions to address considerations such as performance, detailed rendering functions etc. These unique extensions do not necessarily need to be OS independent – this will be up to each vendor. There may be OS specific APIs which will structure interface between the rendered and the OS (event driven etc.)
9.3.2	
9.3.3	
9.3.4	
9.3.5	
9.3.6	
9.4	
9.4.1	**Purpose:** Allow user to enter free text into an editable field of a dialog. The editable field(s) are placed on the dialog by the driver based on the attributes that are defined in the UPDF. The entered text is used later when the driver emits text into the job stream. Text can be numerical, alpha/numerical, special characters, or other defined attributes. The length of the text is also defined in the UPDF as part of the attributes. Examples of using the text entries are User Name, Charger Number, Email notification etc.
9.4.2	**Purpose:** Allow user to select a file from a standard open file picker dialog. The contents of the file can be emitted when the driver emits text into the job stream. Select the file name from a standard ?Save? file picker file dialog and some item can be saved into the selected file. Examples of using the file pickers are select color management files, command file etc.
9.4.3	**Purpose:** Allow user to enter free text into a combo/drop down box. For example, if a combo/drop down box has a fixed sized item list N, the user is able to enter an item to increase the list by N+1. Examples of using this feature are to enter new paper name or paper attributes.
9.4.4	**Purpose:** Allow the developer to logically group the options on the user Interface. Examples of using this feature are grouping several controls And controls 1 is the child of control 2, and control 3.
9.5	
9.6	
10.1	
10.2	
10.3	

3.3 Performance Requirements

Are their things that we can do in the file format that will optimize or enhance performance.

Handling changes in the UPDF can be a performance hit if not handled correctly. Due consideration to this must be give in the specification and implementers guide.

Consideration must be given as to how to efficiently transmit file deltas.

3.4 Design Constraints

3.4.1 Standards Compliance

UPTF-8 or UPTF-16

3.4.2 Hardware Limitations

3.4.3 Software Limitations

3.5 Software System Attributes

Reliability

Availability

Security

Security is not addressed specifically in the UPDF.

Maintainability

Portability