



Department of **Education**

ICT Specialist Standard

Network Laser Printer Standard

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Version 2.8 Final

Table of Contents

1	PURPOSE.....	1
2	SCOPE.....	1
3	COMPLIANCE	1
3.1	Departmental requirements	1
3.2	Timeframe.....	2
3.3	Process for exceptions	2
3.4	Support	2
4	REQUIREMENTS FOR PRINTERS ATTACHED TO PRINT SERVERS.....	2
4.1	Summary overview	3
5	REVIEW APPROACH	3
6	FURTHER INFORMATON.....	4
7	QUALITY CHECKING METHOD.....	4
8	QUALITY CHECKING ARRANGEMENTS.....	4
9	SIGN-OFF	4
APPENDIX A	LIST OF DOE COMPLIANT CUA 25307 NETWORK PRINTERS	5
APPENDIX B	LIST OF CUA 8504B NETWORK PRINTERS.....	10
APPENDIX C	ADDITIONAL INFORMATION	13

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Refer to the Quality Review Report (DO05/139249) located in TRIM.

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1 PURPOSE

The purpose of this document is to:

- Provide a standard for network laser printers within the Department of Education and Training (DET);
- Demonstrate how printers available from CUA 25307 address the DET network printer standard;
- Assist DET, including schools, in the procurement decision for network laser printers; and
- Demonstrate how the benefits of reduced support costs and improved service to end users will result from adherence to the standard.

2 SCOPE

Although there have been broad guidelines for network printers, that have included suggested specifications and functionality, these have fallen short of nominating specific manufacturers products or models of printers. With the Common Use Agreement (CUA) 25307 (*formerly 8504B*) contract that is now available to DET and schools, the Information and Communication Technologies (ICT) Branch is in a position to nominate those printers on the CUA that meet specification and functional requirements of the Department's infrastructure.

This standard will be mandatory for all environments managed by the Department's ICT Customer Service Centre (CSC); i.e. Central Office, District Education Offices, School Administration networks, 100 Schools Project and Learning with ICT schools (both Administration and Curriculum networks).

Please note that the standard relates to connection of printers to the network, and does not take into consideration any application specific issues such as cheque printing from SIS. Application specific printing requirements should be verified by the application support vendor.

3 COMPLIANCE

3.1 Departmental requirements

This standard will be adopted for any future purchases of network laser printers to be connected to the DET network and attached to a file and print server.

3.2 Timeframe

This standard will be aligned with the availability and existence of CUA 25307 (*formerly 8504B*), and will be updated to align with any replacement panel contract (whether DET specific or whole of Government) for network printers.

3.3 Process for exceptions

Please contact your Customer Relationship Manager (CRM) for assistance with any exceptions and purchases of printers outside this standard.

3.4 Support

Only printers connected to a network port will be supported by the ICT Customer Service Centre (CSC).

4 REQUIREMENTS FOR PRINTERS ATTACHED TO PRINT SERVERS

Printers connected to the Department's file and print servers must comply with the DET standard printing model. This standard was developed to reduce support costs associated with incompatible or potentially unstable printer drivers and to improve service delivery.

Note: Information relating to stand alone print servers for legacy printers can be found here: http://intranet.det.wa.edu.au/groups/ict_schools/purchasing_schools_ict/purch-ict-hardware.asp#PrintServers

Although most of the printers offered via the CUA have drivers that comply with DET standards, it is important to note that not all versions of drivers supplied with these printers are compliant. Some printers may require the use of non compliant drivers for certain functionality. It is therefore important to make sure that all required functions will be available. The ICT Customer Service Centre is available to discuss these requirements with you.

The technical part of this document is set out in the following sections:

- **Minimum Standards** (as a quick reference for checking compatibility).
- **Appendix A contains a list of CUA 25307 Laser Printers which comply with the DET standard set out in this document.**

- **Stability** (following recommended printer driver standards set out by Microsoft for printers attached to Windows 2003 and 2008 Server).
- **Compatibility.**
- **Considerations** (after determining that a device adheres to the standard, recommendations for what features make for easier maintenance etc.).
- **More detail** (includes more in depth information for the sections above).

Minimum Standards

Network Printers in this standard conform to the following minimum standards:

- The drivers must be either Unidrv or Postscript drivers containing either UNIDRV.DLL or PSCRIPT5.DLL;
- The printer must include HP printer emulation;
- The printer drivers must be digitally signed by Microsoft;
- The printer must have 10/100 Full Duplex network connectivity (to connect to the DET network as a network printer);
- DHCP and Static IP support;
- Windows 2003 Server/2008 Server/XP driver compatibility;
- TCP/IP printing support;
- No need for management software installation on servers;
- Router/VLAN compatibility;
- User mode drivers (as opposed to Kernel mode).

4.1 Summary overview

Previously, problems have been encountered when business units have purchased devices without consulting ICT about the compatibility with the DET infrastructure. This has resulted in poor response times for call resolution, over-allocation of resources while attempts are made to create workarounds, and in some cases the inability to use the device or some of its intended functions.

The printer specification prescribed in this standard is intended to rectify these issues.

5 REVIEW APPROACH

The devices recommended by this standard will be linked to **CUA 25307 - Supply of Business Machines and Business Machine Consumables**, which is reviewed by DTF quarterly or an as required basis.

6 FURTHER INFORMATION

For further information, contact your Customer Relationship Manager (CRM) via the ICT Customer Service Centre on:

1800 012 828 for country/regional schools; or

(08) 9264 5555 for metro area schools; or

e-mail: customer.servicecentre@det.wa.edu.au.

7 QUALITY CHECKING METHOD

The quality of this standard shall be checked through discussions with relevant parties such as the operations group and relevant Managers.

8 QUALITY CHECKING ARRANGEMENTS

Quality Assurance of this standard shall be achieved by the Project Office and Project Managers if needed.

9 SIGN-OFF

This standard shall be authorised subsequent to:

Sign-off by relevant bodies.

Sign-off by Director Infrastructure and Telecommunication.

Minor version updates shall be authorised after peer review and Sign-off by the Director Infrastructure and Telecommunication via the standard Change Management Process.

APPENDIX A LIST OF DOE COMPLIANT CUA 25307 NETWORK PRINTERS

CUA 25307- Supply of Business Machines and Consumables - Printers Supported for Network Printing.

As at 7th of April 2011.

Kyocera Mita

Device	Compliant	Digitally Signed Unicode PCL	Digitally Signed Unicode PS	HPLJ Emulation	Ethernet	Mono Colour	Current CUA Model	Digitally Signed Unicode x64 PCL	Digitally Signed Unicode x64 PS	Date
FS-1120DN	Yes	Yes	Yes	Yes PCL5/6	Yes	Mono	Yes	No	No	Aug 2010
FS-1320DN	Yes	Yes	Yes	Yes PCL5/6	Yes	Mono	Yes	No	No	Aug 2010
FS-1370DN	Yes	Yes	Yes	Yes PCL5/6	Yes	Mono	Yes	No	No	Aug 2010
FS-2020DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	Yes (MS)	
FS-3920DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	Yes (MS)	
FS-4020DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	Yes (MS)	
FS-6970DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	Yes (MS)	
FS-9530DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes (MS)	Yes	
FS-C5100DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
FS-C5200DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
FS-C5300DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
FS-C5350DN	Yes?	Yes with 5300 Driver	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
FS-C5400DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	

Network Laser Printer Standard

Device	Compliant	Digitally Signed Unicode PCL	Digitally Signed Unicode PS	HPLJ Emulation	Ethernet	Mono Colour	Current CUA Model	Digitally Signed Unicode x64 PCL	Digitally Signed Unicode x64 PS	Date
FS-C8500DN	Yes?	Yes with 8100 Driver	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
FS-1100N	Yes	Yes	Yes	Yes PCL5	Yes	Mono	No	Yes (MS)	No	
FS-1300D	Yes	Yes	Yes	Yes PCL5	Yes	Mono	No	No	No	
FS-1350DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	No	No	No	
FS-C8100DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	No	Yes	Yes	

Lanier

Device	Compliant	Digitally Signed Unicode PCL	Digitally Signed Unicode PS	HPLJ Emulation	Ethernet	Mono Colour	Current CUA Model	Digitally Signed Unicode x64 PCL	Digitally Signed Unicode x64 PS	Date
SP4210N	Yes	No	Yes	Yes PCL5	Yes	Mono	Yes	No	Yes	
SPC820DN	Yes	No	Yes	Yes PCL5	Yes	Colour	Yes	No	Yes	
SP8200N	Yes	No	Yes	Yes PCL5	Yes	Mono	Yes	No	Yes	
LP135N	Yes	No	Yes	Yes PCL5	Yes	Mono	No	No	No	
SPC420DN	Yes	No	Yes	Yes PCL5	Yes	Colour	No	Yes (MS)	Yes (MS)	

Lexmark

Device	Compliant	Digitally Signed Unicode PCL	Digitally Signed Unicode PS	HPLJ Emulation	Ethernet	Mono Colour	Current CUA Model	Digitally Signed Unicode x64 PCL	Digitally Signed Unicode x64 PS	Date
E260DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	No	Yes	
E360DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes (MS)	No	
E460DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	Yes	
T650N	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	No	
T650DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	No	
T652DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	No	
T654DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	Yes	Yes	No	
C540N	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
C543DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
C544DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
C734DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
C736DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
C782DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
C935DN	Yes	Yes	Yes	Yes PCL5	Yes	Colour	Yes	Yes	Yes	
E250DN	Yes	Yes	Yes	Yes PCL5	Yes	Mono	No	Univ.	Univ.	

Ricoh

Device	Compliant	Digitally Signed Unicode PCL	Digitally Signed Unicode PS	HPLJ Emulation	Ethernet	Mono Colour	Current CUA Model	Digitally Signed Unicode x64 PCL	Digitally Signed Unicode x64 PS	Date
AP610N	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	No	No	
SP3300DN	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	No	No	
SP3300DNT	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	No	No	
SP3410DN	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	No	No	Aug 2010
SP4100NL	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	Yes (MS)	No	
SP4210N	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	No	Yes	Aug 2010
SP5100DNT	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	No	Yes	
SP5100N	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	No	Yes	
SP8200DN	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	Yes (MS)	Yes (MS)	
SP9100DN	Yes	No	Yes	Yes PCL5/6	Yes	Mono	Yes	Yes (MS)	Yes	
Pro C900	Yes	No	Yes	Yes PCL5/6	Yes	Colour	Yes	No	Yes	
Pro C900S	No	No	No	Yes PCL5/6	Yes	Colour	Yes	No	Yes	Aug 2010
SPC232SF	Yes	No	Yes	Yes PCL5/6	Yes	Colour	Yes	No	No	
SPC312DN	Yes	No	Yes	Yes PCL5/6	Yes	Colour	Yes	No	No	
SPC320DN	Yes	No	Yes	PCL5/6	Yes	Colour	Yes	Yes	Yes	May 2011
SPC420DN	Yes	No	Yes	Yes PCL5/6	Yes	Colour	Yes	Yes	Yes	

Network Laser Printer Standard

Device	Compliant	Digitally Signed Unicode PCL	Digitally Signed Unicode PS	HPLJ Emulation	Ethernet	Mono Colour	Current CUA Model	Digitally Signed Unicode x64 PCL	Digitally Signed Unicode x64 PS	Date
SPC420DNT	Yes	No	Yes	Yes PCL5/6	Yes	Colour	Yes	Yes (MS)	No	
SPC820DN	Yes	No	Yes	Yes PCL5/6	Yes	Colour	Yes	No	No	
SPC821DN	Yes	No	Yes	Yes PCL5/6	Yes	Colour	Yes	No	No	
SP4210L	Yes	No	Yes	Yes PCL5/6	Yes	Mono	No	No	Yes	
SP320DN	Yes	No	Yes	Yes PCL5/6	Yes	Colour	No	?	?	

*(MS) denotes the basic Microsoft driver available in Windows.

Note: At this point in time to be compliant, a MFD has to be supplied with a Digitally Signed Unicode PCL driver or a Digitally Signed Unicode PS driver, not both.

APPENDIX B LIST OF CUA 8504B NETWORK PRINTERS

This is the list of devices supported under the previous CUA.

CUA No.8504b- Supply of Printers & Scanners Supported for Network Printing

As of 19th of August 2009

Hewlett Packard	DET compatible driver support	Duty Cycle
Laserjet P1505n	PCL & Postscript	Low
Laserjet 2055dn	PCL	Low
LaserJet 5200tn	Postscript	Medium
Laserjet P3015dn	PCL & Postscript	Medium
Laserjet P4015X	PCL & Postscript	High
Laserjet P4515X	PCL & Postscript	High
Laserjet 9050dn	PCL & Postscript	High
Laserjet 1320n	PCL & Postscript	Low
Laserjet 2015n	PCL & Postscript	Low
Laserjet 2420dn	PCL & Postscript	Medium
LaserJet P3005dn	PCL & Postscript	Medium
Laserjet 5100tn	Postscript	Medium
LaserJet 4250dtn	PCL & Postscript	High
LaserJet 4350dtn	PCL & Postscript	High
Laserjet CP1515n	PCL & Postscript	Low
LaserJet CP2025n	PCL	Low
LaserJet CP3525dn	PCL & Postscript	Medium
Laserjet Colour 4700dtn	PCL & Postscript	Medium
Laserjet Colour 5550dtn	PCL & Postscript	High
Laserjet Colour 5550dn	PCL & Postscript	High
LaserJet Colour 2550n	PCL & Postscript	Low
Laserjet Colour 2550Ln	PCL & Postscript	Low
Laserjet Colour 3550	PCL	Low
Laserjet Colour 3600	PCL	Low
Laserjet Colour CP3505dn	PCL & Postscript	Medium
Laserjet Colour 3700dn	PCL & Postscript	Medium
Laserjet Colour 3800dn	PCL & Postscript	Medium
Laserjet Colour 4650dn	PCL & Postscript	Medium
Laserjet Colour 4650dtn	PCL & Postscript	Medium
Laserjet Colour 9500	PCL & Postscript	Medium

Konica Minolta	DET compatible driver support	Duty Cycle
Pagepro 9100	PCL & Postscript	High
Magicolour 2450	Postscript	Low
Magicolour 2350	PCL & Postscript	Low
Magicolour 3300	Postscript	Medium

Kyocera	DET compatible driver support	Duty Cycle
FS-2020DN	PCL	Medium
FS-3920DN	PCL	High
FS-4020DN	PCL	High

FS-820	PCL	Low
FS-1030DN & FS-1030D	PCL & Postscript	Low
FS-1020DN	PCL & Postscript	Low
FS-2000DN	PCL & Postscript	Medium
FS-3900DN	PCL & Postscript	Medium
FS-6950DN	PCL	Medium
FS-1920DN	PCL & Postscript	Medium
FS-3830DN	PCL & Postscript	Medium
FS-4000DN & FS-4000DTN	PCL & Postscript	High
FS-9520DN	PCL & Postscript	High
C5100DN	PCL	Low
C5100DTN	PCL	Low
C5200DN	PCL	Medium
C5200DTN	PCL	Medium
C5300DN	PCL	High
C5030DN	PCL & Postscript	High
C5030DTN	PCL & Postscript	High
C5020N	PCL & Postscript	Low
C5020DN	PCL & Postscript	Low
C5020DTN	PCL & Postscript	Low
C8026DN	PCL & Postscript	Low
C8026DTN	PCL & Postscript	Low

Lexmark	DET compatible driver support	Duty Cycle
E260dn	PCL & Postscript	Low
E360dn	PCL	Low
E460dn	PCL	Low & Medium
T650dn	PCL & Postscript	Medium
T652dtn	PCL & Postscript	Medium
T652dn	PCL & Postscript	High
W840dn	PCL & Postscript	High
E240	PCL	Low
E232	PCL	Low
E250dn	PCL & Postscript	Low
E342n	PCL & Postscript	Low
E450dn	PCL & Postscript	Low & Medium
E332dn	PCL & Postscript	Medium
T430dn	PCL & Postscript	Medium
T642dn	PCL & Postscript	Medium
T644dn	PCL & Postscript	High
W820dn	PCL & Postscript	High
C540n	PCL & Postscript	Low
C543dn	PCL & Postscript	Low
C544dn	PCL & Postscript	Low & Medium
C534dn	PCL & Postscript	Medium
C780dn	PCL & Postscript	Medium
C522n	PCL & Postscript	Low
C524n & C524dn	PCL & Postscript	Low
C510n	PCL & Postscript	Low
C532n & C532dn	PCL & Postscript	Low & Medium
C534dn	PCL & Postscript	Low & Medium

C762dn	PCL & Postscript	Medium
C772dn	PCL & Postscript	Medium
C760dn	PCL & Postscript	High
C912dn	PCL & Postscript	High
C920dn	PCL & Postscript	High
C935dn	PCL & Postscript	High

Ricoh	DET compatible driver support	Duty Cycle
SP3300DN	Postscript	Low
SP4100NL	Postscript	Low
SP4210dn/dnt	Postscript	Medium
AP610n	Postscript	Medium
SP5100DN	Postscript	High
SP8200dn	Postscript	High
SP9100N	Postscript	High
AP400	Postscript	Low
AP410n	Postscript	Medium
SP4110dn	Postscript	Medium
SPC410DN	Postscript	Medium
AP600n	Postscript	Medium
AP3200dn	Postscript	Medium
SPC411DN	Postscript	Medium & High
AP900	Postscript	High
AP4510nai	Postscript	High
SP8100N	Postscript	High
SPC222dn	Postscript	Low
SPC222dnt	Postscript	Medium
SPC420dn	Postscript	Medium
SPC820dn	Postscript	High
CL1000	Postscript	Low
CL5000	Postscript	Low
CL410dn	Postscript	Medium
CL411dn	Postscript	Medium
CL3100dn	Postscript	Medium
CL4000dn	Postscript	Medium
SPC411DN	Postscript	Medium & High
CL411dn	Postscript	High
SPC811DN	Postscript	High
CL7100	Postscript	High
CL7000	Postscript	High

This document will be updated frequently to reflect required changes. It is important that reference is always made to the current version which will be available on the intranet at:

http://intranet.det.wa.edu.au/groups/ict_standards/soe-printer.asp

APPENDIX C ADDITIONAL INFORMATION

Further information & reasoning for the requirements laid out in this document:

Increased Stability

Unstable:

- Kernel mode drivers (if they fail, they can lock the server completely)
- Monolithic printer drivers (the developers write all the printing code)

Stable:

- Unidrv Drivers that use Unidrv.dll are preferred (contain UNIDRV.DLL)
- Postscript drivers that use PSCRIPT5.DLL
- Drivers with the 'Designed for Windows' logo
- User mode drivers are preferable as only one service will lock when a crash occurs
- Listed on Microsoft Hardware Compatibility List (HCL)

Increased Compatibility with Applications

- Using printers that include HP emulation for compatibility with older corporate applications
- Printers that offer compliant Postscript and PCL printer language drivers offer improved compatibility through the availability of an alternate driver
- Fitting with an appropriate amount of memory for the purpose of the printer

Considerations

Economy

- Inkjet printers are recommended for very small printing volume only (otherwise the initial savings of buying such a device is quickly overtaken by the cost of consumables)
- Large high volume printers are only economical when used for high volume printing
- Power requirements (e.g. faster laser printers use higher power fuser elements and may keep them at higher temperatures in standby so that the initial warm up time is decreased)
- Consumable and service requirements
- Total cost of ownership for the life of the printer (capital outlay, support, maintenance, consumables, unit printing costs, energy consumption)

Security

- Print device cannot log onto the network with a domain account
- Device cannot have direct file access capabilities to computers or servers

Service and Repair availability

- Some local warranty agents can provide 24 hour turn around service and repair capabilities for metro area
- Local supply of consumables for metro area

Preferred Capabilities

- Good driver support record from manufacturer
- Ease of use for end user
- Low power consumable and service costs
- Free phone / e-mail technical support from the manufacturer

More Detail*Stability:*

Microsoft recommends using Unidrv or Postscript drivers for server stability. These drivers are identifiable by their inclusion of either UNIDRV.DLL or PSCRIPT5.DLL. On a computer or server with these drivers installed, they can be located by going to "Printers & Faxes" then "File/Server Properties/Drivers", highlight the printer and choose Properties. Lists of files included with the printer driver are then displayed.

Monolithic drivers are drivers that are typically designed to take care of the full printing function usually including spooling, bi-directional communication and "Terminate and Stay Resident" (TSR) programs. These cause the most instability especially if more than one driver of this type is loaded onto one server or computer. Developers often create monolithic drivers to create additional features not accounted for in the Microsoft printing model.

Compatibility:

HP emulation is a standard that dates back to the days when applications had the print driver built in, and as such subsequent printer models from various printer manufacturers have included HP emulation for compatibility with these applications.

A driver being available in both PCL (Printer Control Language) and PS (Post Script) languages creates an alternative method of printing where some print jobs may not be interpreted correctly by the printer or printer driver.

PCL5 = HP Laserjet III emulation

PCL5e = HP Laserjet 4P emulation

PCL6 = Added compression to streamline throughput. Modular architecture for future printers. Not all PCL compliant printers are backwards compatible.

Postscript = The Postscript language was developed for high resolution image setting print jobs, as it is based around vector graphics for fonts. Vector graphics are scalable with higher resolution printers where as PCL printing is based on bitmapped fonts.

If a business unit has the need for larger print jobs and or jobs that are graphically rich, additional printer memory may be required to either speed up, or in the latter facilitate printing.