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Mapping between LPD and IPP Protocols

Status of this Memo

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Abstract

This Internet-Draft specifies the mapping between (1) the commands and operands of the "Line Printer Daemon (LPD) Protocol" specified in RFC 1179 and (2) the operations and parameters of the Internet Printing Protocol (IPP). One of the purposes of this document is to compare the functionality of the two protocols. Another purpose is to facilitate implementation of gateways between LPD and IPP.

This document is an informational document that is not on the standards track. It is intended to help implementors of gateways between IPP and LPD. It also provides an example, which gives additional insight into IPP.

WARNING: RFC 1179 was not on standards track. While RFC 1179 was intended to record existing practice, it fell short in some areas. However, this specification maps between (1) the actual current practice of RFC 1179 and (2) IPP. This document does not attempt to map the numerous divergent extensions to the LPD protocol that have been made by many implementers.

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Mapping between the LPD and IPP Protocols

1. Introduction

The reader of this specification is expected to be familiar with the IPP Model and Semantics specification [ipp-mod], the IPP ~~Protocol specification~~Encoding and transport [ipp-enc], and the Line Printer Daemon (LPD) protocol specification [rfc1179] as described in RFC 1179.

RFC 1179 was written in 1990 in an attempt to document existing LPD protocol implementations. Since then, a number of undocumented extensions have been made by vendors to support functionality specific to their printing solutions. All of these extensions consist of additional control file commands. This document does not address any of these vendor extensions. Rather it addresses existing practice within the context of the features described by RFC 1179. Deviations of existing practice from RFC 1179 are so indicated.

Other LPD control file commands in RFC 1179 are obsolete. They are intended to work on "text" only formats and are inappropriate for many contemporary document formats that completely specify each page. This document does not address the support of these obsolete features.

In the area of document formats, also known as page description languages (PDL), RFC 1179 defines a fixed set with no capability for extension. Consequently, some new PDL's are not supported, and some of those that are supported are sufficiently unimportant now that they have not been registered for use with the Printer MIB[rfc1759] and IPP[ipp-mod] [ipp-enc], though they could be registered if desired. See the Printer MIB specification [rfc1759] and/or the IPP Model specification [ipp-mod] for instructions for registration of document-formats with IANA. IANA lists the registered document-formats as "printer languages".

This document addresses the protocol mapping for both directions: mapping of the LPD protocol to the IPP protocol and mapping of the IPP protocol to the LPD protocol. The former is called the "LPD-to-IPP mapper" and the latter is called the "IPP-to-LPD mapper".

This document is an informational document that is not on the standards track. It is intended to help implementors of gateways between IPP and LPD. It also provides an example, which gives additional insight into IPP.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [abnf].

RFC 1179 uses the word "command" in two contexts: for over-the-wire operations and for command file functions. This document SHALL use the word "command" for the former and the phrase "functions" for the latter. The syntax of the LPD commands is given using ABNF [abnf].

The following tokens are used in order to make the syntax more readable:

        LF stands for %x0A (linefeed)
        SP stands for %x20. (space)
        DIGIT stands for %x30-39 ("0" to "9")

3. Mapping from LPD Commands to IPP Operations

This section describes the mapping from LPD commands to IPP operations. Each of the following sub-sections appear as sub-sections of section 5 of RFC 1179.

112   The following table summarizes the IPP operation that the mapper uses when it receives an LPD command. Each section below
113   gives more detail.

LPD command   **IPP operation**

print-any-waiting-jobs   *ignore*
receive-a-printer-job   Print-Job or Create-Job/Send-Document
send queue state (short or long)   Get-Printer-Attributesand Get-Jobs
remove-jobs   Cancel-Job

114   3.1 Print any waiting jobs

115   Command syntax:

116   print-waiting-jobs = %x01 printer-name LF

117   This command causes the LPD daemon check its queue and print any waiting jobs. An IPP printer handles waiting jobs without
118   such a nudge.

119   If the mapper receives this LPD command, it SHALL ignore it and send no IPP operation.

120   3.2 Receive a printer job

121   Command syntax:

122   receive-job = %x02 printer-name LF

123   The control file and data files mentioned in the following paragraphs are received via LPD sub-commands that follow this
124   command. Their mapping to IPP commands and attributes is described later in this section.

125   The mapper maps the 'Receive a printer job' command to either:

126   •   the Print-Job operation which includes a single data file or
127   •   the Create-Job operation followed by one Send-Document operation for each data file.

128   If the IPP printer supports both Create-Job and Send-Document, and if a job consists of:

129   •   a single data file, the mapper SHOULD use the Print-Job operation, but MAY use the Create-Job and Send-
130   Document operations.
131   •   more than one data file, the mapper SHALL use Create-Job followed by one Send-Document for each received
132   LPD data file.

133   If the IPP printer does not support both Create-Job and Send-Document, and if a job consists of:

134   •   a single data file, the mapper SHALL use the PrintJob operation.
135   •   more than one data file, the mapper SHALL submit each received LPD data file as a separate Print-Job
136   operation (thereby converting a single LPD job into multiple IPP jobs).

137   If the mapper uses Create-Job and Send-Document, it MUST send the Create-Job operation before it sends any Send-Document
138   operations whether the LPD control file, which supplies attributes for Create-Job, arrives before or after all LPD data files.

139 NOTE: This specification does *not* specify how the mapper maps: the LPD Printer-name operand to the IPP "printer-uri"
140 parameter.

141 The following 3 sub-sections gives further details about the mapping from LPD receive-a-printer-job sub-commands. Each of
142 the following sub-sections appear as sub-sections of section 6 of RFC 1179.

143 **3.2.1 Abort job**

144 Sub-command syntax:

145   abort-job = %x1 LF

146 This sub-command of receive-a-printer-job is intended to abort any job transfer in process.

147 If the mapper receives this sub-command, it SHALL cancel the job that it is in the process of transmitting.

148 If the mapper is in the process of sending a Print-Job or Create-Job operation, it terminates the job either by closing the
149 connection, or performing the Cancel-Job operation with the job-uri that it received from the Print-Job or Create-Job operation.

150 NOTE: This sub-command is implied if at any time the connection between the LPD client and server is terminated before an
151 entire print job has been transferred via an LPD Receive-a-printer-job request.

152 **3.2.2 Receive control file**

153 Sub-command syntax:

154   receive-control-file = %x2 number-of-bytes SP name-of-control-file LF
155   number-of-bytes = 1*DIGIT
156   name-of-control-file = "cfA" job-number client-host-name
157   ; e.g. "cfA123woden"
158   job-number = 3DIGIT
159   client-host-name = <a host name>

160 This sub-command is roughly equivalent to the IPP Create-Job operation.

161 The mapper SHALL use the contents of the received LPD control file to create IPP parameter and attribute values to transmit
162 with the Print-Job or Create-Job operation.

163 **3.2.3 Receive data file**

164 Sub-command syntax: %x3 number-of-bytes-in-data-file Name-of-data-file

165   receive-data-file = %x03 number-of-bytes SP name-of-data-file LF
166   number-of-bytes = 1*DIGIT
167   name-of-data-file = "df" letter job-number client-host-name
168   ; e.g. "dfA123woden for the first file
169   letter = %x41-5A / %x61-7A   ; "A" to "Z", "a" to "z"
170   ; first file is "A",
171   ; second "B", and 52nd file is "z"
172   job-number = 3DIGIT

173   client-host-name = <a host name>

174   This sub-command is roughly equivalent to the IPP Send-Document operation.

175   The mapper SHALL use the contents of the received LPD data file as the data to transmit with the IPP Print-Job or Send-
176   Document operation.

177   Although RFC-1179 alludes to a method for passing an unspecified length data file by using an octet-count of zero, no
178   implementations support this feature.. The mapper SHALL reject a job that has a value of 0 in the number-of-bytes field.

179   ## 3.3 Send queue state (short)

180   Command syntax:

181   send-queue-short = %x03 printer-name *(SP(user-name / job-number)) LF

182   The mapper's response to this command includes information about the printer and its jobs. RFC 1179 specifies neither the
183   information nor the format of its response. This document requires the mapper to follow existing practice as specified in this
184   document.

185   The mapper SHALL produce a response in the following format which consists of a printer-status line optionally followed by a
186   heading line, and a list of jobs. This format is defined by examples below. Appendix A contains the ABNF syntax.

187   For an printer with no jobs, the response starts in column 1 and is:

188   `no entries`

189   For a printer with jobs, an example of the response is:

```
190    killtree is ready and printing
191    Rank    Owner      Job           Files              Total Size
192    active fred       123           stuff              1204 bytes
193    1st     smith      124           resume, foo        34576 bytes
194    2nd     fred       125           more               99 bytes
195    3rd     mary       126           mydoc              378 bytes
196    4th     jones      127           statistics.ps      4567 bytes
197    5th     fred       128           data.txt           9 bytes
198
199    The column numbers of above headings and job entries are:
200
201    |       |          |             |                  |
202    01      08         19            35                 63
203
```

204   The mapper SHALL produce each field above from the following IPP attribute:

LPD field	IPP attribute	special conversion details
printer-status	printer-state and printer-state-reasons	For a printer-state of idle or processing, the mapper SHALL use the formats above. For stopped, the mapper SHALL use printer-state-reasons to produce an unspecified format for the error.
rank	number-of-intervening-jobs	the mapper SHALL the format above
owner	job-originating-user-name	unspecified conversion; job-originating-user-name may be the mapper's user-name

job	job-id	the mapper shall use the job-id
files	document-name	the mapper shall create a comma separated list of the document-names and then truncate this list to the first 24 characters
total-size	job-k-octets*copies*1024	the mapper shall multiple the value of job-k-octets by 1024 and by the value of the "copies" attribute.

205

206 A mapper SHOULD use the job attribute number-of-intervening-jobs rather than the job's position in a list of jobs to determine
207 'rank' because a Printer may omit jobs that it wants to keep secret. If a printer doesn't support the job attribute number-of-
208 intervening-jobs, a mapper MAY use the job's position.

209 Note: a Printer may set the value of job-originating-user-name to the authenticated user or to the value of "requesting-user-name",
210 depending on the implementation and configuration. For a gateway, the authenticated user is the user-id of the gateway, but the
211 "requesting-user-name" may contain the name of the user who is the gateway's client.

212 In order to obtain the information specified above, The LPD-to-IPP mapper SHALL use the Get-Printer-Attributes operation to
213 get printer-status and SHOULD use the Get-Jobs operation to get information about all of the jobs. If the LPD command contains
214 job-numbers or user-names, the mapper MAY handle the filtering of the response. If the LPD command contains job-numbers but
215 no user-names, the mapper MAY use Get-Job-Attributes on each converted job-number rather than Get-Jobs. If the LPD
216 command contains a single user-name but no job-numbers, the mapper MAY use Get-Jobs with the my-jobs option if the server
217 supports this option and if the server allows the client to be a proxy for the LPD user.

218 NOTE: This specification does *not* define how the mapper maps the LPD Printer-name operand to the IPP "printer-uri"
219 parameter.

3.4 Send queue state (long)

220

221 Command syntax:

222 　　　send-queue-long = %x04 printer-name *(SP(user-name / job-number)) LF

223 The mapper's response to this command includes information about the printer and its jobs. RFC 1179 specifies neither the
224 information nor the format of its response. This document requires the mapper to follow existing practice as specified in this
225 document.

226 The mapper SHALL produce a response in the following format which consists of a printer-status line optionally followed a list
227 of jobs, where each job consists of a blank line, a description line, and one line for each file. The description line contains the
228 user-name, rank, job-number and host. This format is defined by examples below. Appendix B contain the ABNF syntax.

229 For an printer with no jobs the response is:

230 `no entries`

231 For a printer with jobs, an example of the response is:

```
killtree is ready and printing

fred: active                      [job 123 tiger]
        2 copies of stuff         602 bytes

smith: 1st                        [job 124 snail]
        2 copies of resume        7088 bytes
        2 copies of foo           10200 bytes
```

```
240
241    fred: 2nd                            [job 125 tiger]
242          more                           99 bytes
243
```

244   The column numbers of above headings and job entries are:

245

```
246    |         |                          |
247    01        09                         41
```

248

249   Although the format of the long form is different from the format of the short form, their fields are identical except for a) the
250   copies and host fields which are only in the long form, and b) the "size" field contains the single copy size of each file. Thus the
251   sum of the file sizes in the "size" field times the value of the "copies" field produces the value for the "Total Size" field in the
252   short form. For fields other than the host and copies fields, see the preceding section. For the host field see the table below.

LPD field	IPP attribute	special conversion details
host		unspecified conversion; job-originating-host may be the mapper's host
copies	copies	the mapper shall assume the value of copies precedes the string "copies of "; otherwise, the value of copies is 1.

253

254   NOTE: This specification does *not* define how the mapper maps the LPD Printer-name operand to the IPP printer-uri parameter.

255   3.5 Remove jobs

256   Command syntax:

257   remove-jobs = %x05 printer-name SP agent
258   *(SP(user-name / job-number)) LF

259   The agent operand is the user-name of the user initiating the remove-jobs command. The special user-name 'root' indicates a
260   privileged user who can remove jobs whose user-name differs from the agent..

261   The mapper SHALL issue one Cancel-Job operation for each job referenced by the remove-jobs command. Each job-number in
262   the remove-jobs command references a single job. Each user-name in the remove-jobs command implicitly references all jobs
263   owned by the specified user. The active job is implicitly referenced when the remove-jobs command contains neither job-
264   numbers nor user-names. The mapper MAY use Get-Jobs to determine the job-uri of implicitly referenced jobs.

265   The mapper SHALL not use the agent name of 'root' when end-users cancel their own jobs. Violation of this rule creates a
266   potential security violation, and it may cause the printer to issue a notification that misleads a user into thinking that some other
267   person canceled the job.

268   If the agent of a remove-jobs command for a job J is the same as the user name specified with the 'P' function in the control file
269   for job J, then the mapper SHALL ensure that the caller of the Cancel-Job command for job J is the same as job-originating-user
270   for job J.

271   Note: This requirement means that a mapper must be consistent in who the receiver perceives as the caller of IPP operations. The
272   mapper either acts as itself or acts on behalf of another user. The latter is preferable if it is possible. This consistency is necessary
273   between Print-Job/Create-Job and Cancel-Job in order for Cancel-Job to work, but it is also desirable for other operations. For
274   example, Get-Jobs may give more information about job submitted by the caller of this operation.

275   NOTE: This specification does *not* define how the mapper maps: (1) the LPD printer-name to the IPP "printer-uri" or (2) the
276   LPD job-number to the IPP "job-uri".

277   NOTE: This specification does not specify how the mapper maps the LPD user-name to the IPP job-originating-user because the
278   mapper may use its own user-name with jobs.

4.   Mapping of LPD Control File Lines to IPP Parameters

280   This section describes the mapping from LPD control file lines (called 'functions') to IPP operation input parameters. The
281   mapper receives the control file lines via the LPD receive-control-file sub-command.. Each of the LPD functions appear as sub-
282   sections of section 7 of RFC 1179.

283   In LPD control file lines, the text operands have a maximum length of 31 or 99 while IPP input parameters have a maximum of
284   255 characters. Therefore, no data is lost.

285   The mapper converts each supported LPD function to its corresponding IPP parameter as defined by tables in the subsections that
286   follow. These subsections group functions according to whether they are:

287   • required with a job,
288   • optional with a job
289   • required with each document.

290   In the tables below, each LPD value is given a name, such as 'h'. If an IPP value uses the LPD value, then the IPP value column
291   contains the LPD name, such as 'h' to denote this. Otherwise, the IPP value column specifies the literal value.

4.1   Required Job Functions

293   The following LPD functions MUST be in a received LPD job. The mapper SHALL receive each of the following LPD functions
294   and SHALL include the information as a parameter with each IPP job. The functions SHOULD be in the order 'H', 'P' and they
295   SHOULD be the first two functions in the control file, but they MAY be anywhere in the control file and in any order.

LPD function			IPP	
name	value	description	name	value
H	*h*	Originating Host		*h* (in security layer)
P	*u*	User identification	requesting-user-name	*u* (and in security layer)
		none	ipp-attribute-fidelity	'true'

296   A mapper MAY sends its own host rather than the client's host, and a mapper MAY send its own user-name as user identification
297   rather than the client user. But in any case, the values sent SHALL be compatible with the Cancel-Job operation. The IPP
298   operation MAY have no way to specify an originating host-name.

299   The mapper SHALL include ipp-attribute-fidelity =true so that it doesn't have to determine which attributes a printer supports.

4.2   Optional Job Functions

301   The following LPD functions MAY be in a received job. These function SHOULD follow the required job functions and precede
302   the document functions, but they MAY be anywhere in the control file.

303   If the mapper receives such an LPD function, the mapper SHALL include the corresponding IPP attribute with the value
304   converted as specified in the table below. If the mapper does not receive such an LPD attribute, the mapper SHALL NOT
305   include the corresponding IPP attribute, except the 'L' LPD function whose absence has a special meaning as noted in the table.

| LPD function | | | IPP | |
name	value	description	name	value
J	*j*	Job name for banner page	job-name	*j*
L	*l*	Print banner page	job-sheets	'standard' if 'L' is present
				'none' if 'L' is present
M	*m*	Mail When Printed		IPP has no notification mechanism. To support this LPD feature, the gateway must poll

306 .

4.3 Required Document Functions

308 The mapper SHALL receive one set of the required document functions with each copy of a document, and SHALL include the
309 converted information as parameters with each IPP document

310 If the control file contains required and recommended document functions, the required functions SHOULD precede the
311 recommended ones and if the job contains multiple documents, all the functions for each document are grouped together as
312 shown in the example of section 6.3 "Required Document Functions". However, the document functions MAY be in any order.

313

| LPD function | | | IPP | |
name	value	description	name	value
f	fff	Print formatted file	document-format	'application/octet-stream'
l	fff	Print file leaving control characters	document-format	'application/octet-stream'
o	fff	Print Postscript output file	document-format	'application/PostScript'
			copies	see note

314 Note: In practice, the 'f' LPD function is often overloaded. It is often used with any format of document data including PostScript
315 and PCL data.

316 Note: In practice, the 'l' LPD function is often used as a rough equivalent to the 'f' function.

317 Note: When RFC 1179 was written, no implementation supported the 'o' function; instead 'f' was used for PostScript. Windows
318 NT now sends 'o' function for a PostScript file.

319 Note: the value 'fff' of the 'f', 'l' and 'o' functions is the name of the data file as transferred, e.g. "dfA123woden".

320 If the mapper receives any other lower case letter, the mapper SHALL reject the job because the document contains a format that
321 the mapper does not support.

322 The mapper determines the number of copies by counting the number of occurrences of each 'fff' file with one of the lower-case
323 functions above. For example, if 'f dfA123woden' occurs 4 times, then copies has a value of 4. Although the LPD protocol
324 allows the value of copies to be different for each document, the commands and the receiving print systems don't support this.

325   ## 4.4 Recommended Document Functions

326   The mapper SHOULD receive one set of the recommended document functions with each document, and SHOULD include the
327   converted information as parameters with each IPP document. The functions SHOULD be received in the order 'U' and 'N', but
328   they MAY arrive in any order.

LPD function			IPP	
name	value	description	name	value
U	*fff*		*ignored*	
N	*n*	Name of source file	document-name	*n*

329   Note: the value '*fff*' of the 'U' function is the name of the data file as transferred, e.g. "dfA123woden".

330   # 5. Mapping from IPP operations to LPD commands

331   If the IPP-to-LPD mapper receives an IPP operation, the following table summarizes the LPD command that it uses. Each section
332   below gives the detail. Each of the following sub-sections appear as sub-sections of section 3 in the document "Internet Printing
333   Protocol/1.0: Model and Semantics" [ipp-mod].

IPP operation	LPD command
Print-Job or Print-URI or	receive-a-printer-job
Create-Job/Send-Document/Send-URI	and then print-any-waiting-jobs
Validate-Job	implemented by the mapper
Cancel-Job	remove-jobs
Get-Printer-Attributes, Get-Job-Attributes or Get-Jobs	send queue state (short or long)

334   ## 5.1 Print-Job

335   The mapper SHALL send the following commands in the order listed below:

336   - receive-a-printer-job command
337   - both receive-control-file sub-command and receive-data-file sub-command
338   (unspecified order, see Note below)
339   - print-any-waiting-jobs command,
340   except that if the mapper is sending a sequence of receive-a-printer-job commands, it MAY omit sending print-
341   any-waiting-jobs after any receive-a printer-job command that is neither the first nor last command in this
342   sequence

343   Note: it is recommended that the order of the receive-control-file sub-command and the receive-data-file sub-command be
344   configurable because either order fails for some print systems. Some print systems assume that the control file follows all data
345   files and start printing immediately on receipt of the control file. When such a print system tries to print a data file that has not
346   arrived, it produces an error. Other print systems assume that the control file arrives before the data files and start printing when
347   the first data file arrives. Such a system ignores the control information, such as banner page or copies.

348   NOTE: This specification does not define the mapping between the IPP printer-uri and the LPD printer-name.

349   The mapper SHALL send the IPP parameters and attributes received from the operation to the LPD printer by using the LPD
350   receive-control-file sub-command. The mapper SHALL create the LPD job-number for use in the control file name, but the

351 receiving printer MAY, in some circumstances, assign a different job-number to the job. The mapper SHALL create the IPP job-
352 id and IPP job-uri returned in the Print-Job response.

353 NOTE: This specification does not specify how the mapper determines the LPD job-number, the IPP job-id or the IPP job-uri of
354 a job that it creates nor does it specify the relation ship between the IPP job-uri, IPP the job-id and the LPD job-number, both of
355 which the mapper creates. However, it is likely that the mapper will use the same integer value for both theLPD job-number and
356 the IPP job-id, and that the IPP Job-uri is the printer's URI with the job-id concatenated on the end.

357 The mapper SHALL send data received in the IPP operation to the LPD printer by using the LPD receive-data-file sub-command.
358 The mapper SHALL specify the exact number of bytes being transmitted in the number-of-bytes field of the receive-data-file sub-
359 command. It SHALL NOT use a value of 0 in this field.

360 If the mapper, while it is transmitting a receive-a-printer-job command or sub-command, either detects that its IPP connection has
361 closed or receives a Cancel-Job operation, the mapper SHALL terminate the LPD job either with the abort sub-command or the
362 remove-jobs command.

363 ISSUE: error code conversion.

5.2 Print-URI

365 The mapper SHALL handle this operation in the same way as a Print-Job operation except that it SHALL obtain data referenced
366 by the "document-uri" parameter and SHALL then treat that data as if it had been received via a Print-Job operation.

5.3 Validate-Job

368 The mapper SHALL perform this operation directly. Because LPD supports very few attributes, this operation doesn't have much
369 to check.

5.4 Create-Job

371 The mapper SHALL handle this operation like Print-Job, except

372 • the mapper SHALL send the control file after it has received the last Send-Document or Send-URI operation
373   because the control file contains all the document-name and document-format values specified in the Send-
374   Document and Send-URI operations.
375 • the mapper SHALL perform one receive-data-file sub-command for each Send-Document or Send-URI
376   operation received and in the same order received.
377 • the mapper SHALL send the control file either before all data files or after all data files.
378   (See the note in the section on Print-Job about the dilemma of sending the control file either before or after the
379   data files.

5.5 Send-Document

381 The mapper performs a receive-data-file sub-command on the received data. See the preceding section 5.4 "Create-Job" for the
382 details.

5.6 Send-URI

The mapper SHALL obtain the data referenced by the "document-uri" parameter, and SHALL then treat that data as if it had been received via a Send-Document operation. See the preceding section 5.5 "Send-Document" for the details.

5.7 Cancel-Job

The mapper SHALL perform a remove-jobs command with the following parameters:

- the printer is the one to which the job was submitted, that is the IPP printer-uri is mapped to an LPD printer-name by the same mechanism as for all commands. ,
- the agent is the authenticated user-name of the IPP client,
- the job-number is the job-id returned by the Print-Job command, that is, the LPD job-number has the same value as the IPP job-id for likely implementations. .

5.8 Get-Printer-Attributes

LPD severely limits the set of attributes that the mapper is able to return in its response for this operation. The mapper SHALL support, at most, the following printer attributes:

- printer-state
- printer-state-reasons

The mapper uses either the long or short form of the "send queue state" command.

The mapper SHALL assume that the LPD response that it receives has the format and information specified in section 3.3 "Send queue state (short)" and section 3.4 "Send queue state (long)". The mapper SHALL determine the value of each requested attribute by using the inverse of the mapping specified in the two aforementioned sections.

Note: the mapper can determine the response from the printer-status line without examining the rest of the LPD response.

5.9 Get-Job-Attributes

LPD severely limits the set of attributes that the mapper is able to return in its response for this operation. The mapper SHALL support, at most, the following job attributes:

- number-of-intervening-jobs
- job-originating-user-name
- job-id
- document-name
- job-k-octets
- copies

The mapper uses either the long or short form of the "send queue state" command. If it receives a request for the "job-k-octets" or "copies" and supports the attribute it SHALL use the long form; otherwise, it SHALL use the short form.

Note: the value of job-k-octets is the value in the short form divided by the number of "copies" which is on the long form only. Its value can also be determined by adding the "size" field values for each document in the job in the long form.

416 The mapper SHALL assume that the LPD response that it receives has the format and information specified in section 3.3 "Send
417 queue state (short)" and section 3.4 "Send queue state (long)". The mapper SHALL determine the value of each requested
418 attribute by using the inverse of the mapping specified in the two aforementioned sections.

419 Note: when the mapper uses the LPD short form, it can determine the response from the single LPD line that pertains to the job
420 specified by the Get-Job-Attributes operation.

421 NOTE: the mapper can use its correspondence between the IPP job-id, job-uri and the LPD job-number.

5.10 Get-Jobs

423 The mapper SHALL perform this operation in the same way as Get-Job-Attributes except that the mapper converts all the LPD
424 job-lines, and the IPP response contains one job object for each job-line in the LPD response..

6. Mapping of IPP Parameters to LPD Control File Lines

426 This section describes the mapping from IPP operation input parameters to LPD control file lines (called 'functions'). The
427 mapper receives the IPP operation input parameters via the IPP operation. Each of the IPP operation input parameters appear as
428 sub-sections of section 3 and 4.2 in the IPP model document [ipp-mod].

429 In the context of LPD control file lines, the text operands have a maximum length of 31 or 99 while IPP input parameters have a
430 maximum of 255 characters. Therefore, there may be some data loss if the IPP parameters exceed the maximum length of the
431 LPD equivalent operands.

432 The mapper converts each supported IPP parameter to its corresponding LPD function as defined by tables in the subsections that
433 follow. These subsections group functions according to whether they are:

434   •   required with a job,
435   •   optional with a job
436   •   required with each document.

437 In the tables below, each IPP value is given a name, such as 'h'. If an LPD value uses the IPP value, then the LPD value column
438 contains the IPP name, such as 'h' to denote this. Otherwise, the LPD value column specifies the literal value.

6.1 Required Job Functions

440 The mapper SHALL include the following LPD functions with each job, and they SHALL have the specified value. They SHALL
441 be the first functions in the control file and they SHALL be in the order "H" and then "P".

IPP name	value	LPD function name	value	description
(perhaps in security layer)	*h*	H	*gateway host*	Originating Host
requesting-user-name and in the security layer	*u*	P	*u*	User identification

442 A mapper SHALL sends its own host rather than the client's host, because some LPD systems require that it be the same as the
443 host from which the remove-jobs command comes. A mapper MAY send its own user name as user identification rather than the
444 client user. But in any case, the values sent SHALL be compatible with the LPD remove-jobs operation.

445   ## 6.2 Optional Job Functions

446   The mapper MAY include the following LPD functions with each job. They SHALL have the specified value if they are sent.
447   These functions, if present, SHALL follow the require job functions, and they SHALL precede the required document functions.

448

IPP attribute		LPD function		
name	value	name	value	description
job-name	*j*	J	*j*	Job name for banner page
job-sheets	'standard'	L	*u*	Print banner page
job-sheets	'none'			omit 'L' function

449   Note: 'L' has special meaning when it is omitted. If 'J' is omitted, some undefined behavior occurs with respect to the banner
450   page.

451   ## 6.3 Required Document Functions

452   The mapper SHALL include one set of the following LPD functions with each document, and they SHALL have the specified
453   values. For each document, the order of the functions SHALL be 'f', 'U' and then 'N', where 'f' is replicated once for each copy.

IPP attribute		LPD function		
name	value	name	value	description
document-format	'application/octet-stream' or 'application/PostScript'	f	*fff*	Print formatted file
copies	*c*			replicate 'f' 'c' times
none		U	*fff*	Unlink data file
document-name	*n*	N	*n*	Name of source file

454   Note: the value '*fff*' of the 'f' and 'U' functions is the name of the data file as transferred, e.g. "dfA123woden".

455   Note: the mapper SHALL not send the 'o' function

456   ISSUE: should we register DVI, troff or ditroff?

457   If the mapper receives no "ipp-attribute-fidelitybest-effort" or it has a value of false, then the mapper SHALL reject the job if it
458   specifies attributes or attribute values that are not among those supported in the above tables.

459   Below is an example of the minimal control file for a job with three copies of two files 'foo' and 'bar':

460   H tiger
461   P jones
462   f dfA123woden
463   f dfA123woden
464   f dfA123woden
465   U dfA123woden
466   N foo
467   f dfB123woden
468   f dfB123woden
469   f dfB123woden
470   U dfB123woden
471   N bar

7. Security **Considerations**

473 There are no security issues beyond those covered in the IPP protocol document [ipp-enc], the IPP model document [ipp-mod]
474 and the LPD document [rfc1179].

8. References

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485

10. Appendix A: ABNF Syntax for response of Send-queue-state (short)

487 The syntax in ABNF for the response to the LPD command 'send-queue-state (long)' is:

```
488    status-response = empty-queue / nonempty-queue
489    empty-queue = "no-entries" LF
490    nonempty-queue = printer-status LF heading LF *(job LF)
491    printer-status =  OK-status / error-status
```

492   OK-status = printer-name SP "ready and printing" LF
493   error-status = < implementation dependent status information >
494   heading = "Rank" 3SP "Owner" 6SP "Job" 13SP "Files"
495   23SP "Total Size" LF
496   ; the column headings and their values below begin at the columns
497   ; 1, 8, 19, 35 and 63
498   job = rank *SP owner *SP job *SP files *SP total-size "bytes"
499   ; jobs are in order of oldest to newest
500   rank = "active" / "1st" / "2nd" / "3rd" / integer "th"
501   ; job that is printing is "active"
502   ; other values show position in the queue
503   owner = <user name of person who submitted the job>
504   job = 1*3DIGIT   ; job-number
505   files = <file name> *("," <file name>) ; truncated to 24 characters
506   total-size = 1*DIGIT ; combined size in bytes of all documents

11. Appendix B: ABNF Syntax for response of Send-queue-state (long)

508   The syntax in ABNF for the response to the LPD command 'send-queue-state (long)' is:

509   status-response = empty-queue / nonempty-queue
510   empty-queue = "no-entries" LF
511   nonempty-queue = printer-status LF *job
512   printer-status = OK-status / error-status
513   OK-status = printer-name SP "ready and printing" LF
514   error-status = < implementation dependent status information >
515   job = LF line-1 LF line-2 LF
516   line-1 = owner ":" SP rank 1*SP "[job" job SP host "]"
517   line-2 = file-name 1*SP document-size "bytes"
518   ; jobs are in order of oldest to newest
519   rank = "active" / "1st" / "2nd" / "3rd" / integer "th"
520   ; job that is printing is "active"
521   ; other values show position in the queue
522   owner = <user name of person who submitted the job>
523   job = 1*3DIGIT
524   file-name = [1*DIGIT "copies of" SP] <file name>
525   ; truncated to 24 characters
526   document-size = 1*DIGIT ;size of single copy of the document.

12. Appendix C: Unsupported LPD functions

528   The follow LPD functions have no IPP equivalent. The LPD-to-IPP mapper ignores them and the IPP-to-LPD mapper does not
529   send them.

LPD command	
name	description
C	Class for banner page
I	Indent Printing
H	Host of client
M	Mail when printed
S	Symbolic link data
T	Title for pr

W	Width of output
1	troff R font
2	troff I font
3	troff B font
4	troff S font

530

531 The follow LPD functions specify document-formats which have no IPP equivalent, unless someone registers them. The LPD-to-
532 IPP mapper rejects jobs that request such a document format, and the IPP-to-LPD mapper does not send them.

LPD command

name	description
c	Plot CIF file
d	Print DVI file
g	Plot file
k	reserved for Kerberized clients and servers
n	Print ditroff output file
p	Print file with 'pr' format
r	File to print with FORTRAN carriage control
t	Print troff output file
v	Print raster file
z	reserved for future use with the Palladium print system

533

534   13.   Appendix D: Full Copyright Statement

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