

1 PWG-DRAFT - 15 ISSUES are numbered and highlighted like this
2 ipp-ops-admin-990625.txt

Carl Kugler
IBM Corporation
T. Hastings
Xerox Corporation
June 25, 1999

3
4
5
6
7 Internet Printing Protocol/1.0 & 1.1: Additional Administrative Operations
8

9 Status of this Memo

10 This document is a PWG-Draft. It is intended for registration following the registration procedures of
11 IPP/1.0 [RFC2566] and IPP/1.1 [ipp-mod]. This version includes the comments discussed at the IPP
12 telecon, on 6/23/1999.

13 Abstract

14 This document specifies eight additional OPTIONAL administrative operations for use with the Internet
15 Printing Protocol/1.0 (IPP) [RFC2565, RFC2566] and IPP/1.1 [ipp-mod, ipp-pro]. These operations are 4
16 Printer object operations that operators/administrators may perform on a Printer object:

17 Set-Printer-Attributes
18 Enable-Printer
19 Disable-Printer
20 Shutdown-Printer

21 and 4 Job object operations that end-users may perform on their jobs and operators/administrators may
22 perform on any job:

23 Set-Job-Attributes
24 Reprocess-Job
25 Cancel-Current-Job (though the target is the Printer object)
26 Space-Current-Job (though the target is the Printer object)

27 In addition, two operation attributes: "job-message-from-operator" and "printer-message-from-operator"
28 are included to set the corresponding Job and Printer Description attributes.

29 Finally, a new 'client-error-attributes-not-settable' is defined for use with the two Set operations.

30 The full set of IPP documents includes:

- 31 Design Goals for an Internet Printing Protocol [RFC2567]
- 32 Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]
- 33 Internet Printing Protocol/1.1: Model and Semantics (this document)
- 34 Internet Printing Protocol/1.1: Encoding and Transport [IPP-PRO]
- 35 Internet Printing Protocol/1.1: Implementer's Guide [IPP-IIG]
- 36 Mapping between LPD and IPP Protocols [RFC2569]

37

38 The "Design Goals for an Internet Printing Protocol" document takes a broad look at distributed printing
39 functionality, and it enumerates real-life scenarios that help to clarify the features that need to be included
40 in a printing protocol for the Internet. It identifies requirements for three types of users: end users,
41 operators, and administrators. It calls out a subset of end user requirements that are satisfied in IPP/1.0. A
42 few OPTIONAL operator operations have been added to IPP/1.1.

43 The "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol" document
44 describes IPP from a high level view, defines a roadmap for the various documents that form the suite of
45 IPP specification documents, and gives background and rationale for the IETF working group's major
46 decisions.

47 The "Internet Printing Protocol/1.1: Encoding and Transport" document is a formal mapping of the abstract
48 operations and attributes defined in the model document onto HTTP/1.1 [RFC2616]. It defines the
49 encoding rules for a new Internet MIME media type called "application/ipp". This document also defines
50 the rules for transporting over HTTP a message body whose Content-Type is "application/ipp". This
51 document defines a new scheme named 'ipp' for identifying IPP printers and jobs.

52 The "Internet Printing Protocol/1.1: Implementer's Guide" document gives insight and advice to
53 implementers of IPP clients and IPP objects. It is intended to help them understand IPP/1.1 and some of the
54 considerations that may assist them in the design of their client and/or IPP object implementations. For
55 example, a typical order of processing requests is given, including error checking. Motivation for some of
56 the specification decisions is also included.

57 The "Mapping between LPD and IPP Protocols" document gives some advice to implementers of gateways
58 between IPP and LPD (Line Printer Daemon) implementations.

59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76

Table of Contents

- 1. Introduction4
- 2. New Operation attributes4
 - 2.1 New operation attribute: "printer-message-from-operator" (text(127)).....4
 - 2.2 New operation attribute: "job-message-from-operator" (text(127))5
- 3. New status code: 'client-error-attributes-not-settable'6
- 4. Summary of Administrative operations and Operation-Id Assignments.....6
 - 4.1 Printer Operations7
 - 4.1.1 Set-Printer-Attributes Operation7
 - 4.1.2 Disable-Printer Operation11
 - 4.1.3 Enable-Printer Operation11
 - 4.1.4 Shutdown-Printer Operation12
 - 4.2 Job Operations13
 - 4.2.1 Set-Job-Attributes14
 - 4.2.2 Reprocess-Job Operation17
 - 4.2.3 Cancel-Current-Job Operation17
 - 4.2.4 Space-Current-Job operation19

77 1. Introduction

78 The Internet Printing Protocol (IPP) is an application level protocol that can be used for distributed printing
79 using Internet tools and technologies. IPP version 1.1 (IPP/1.1) focuses only on end user functionality with
80 a few administrative operations included. This document defines additional OPTIONAL end user and
81 administrative operations used to control Jobs and Printers. This document is a registration proposal for an
82 extension to IPP/1.0 and IPP/1.1 following the registration procedures in those documents.

83 2. New Operation attributes

84 This section defines the new "printer-message-from-operation" and "job-message-from-operator" operation
85 attributes that set the corresponding Printer and Job Description attributes.

86 2.1 New operation attribute: "printer-message-from-operator" (text(127))

87 Type of registration: attribute

88 Proposed keyword name of this attribute: "printer-message-from-operator"

89 Types of attribute (Operation, Job Template, Job Description, Printer Description): Operation

90 Operations to be used with if the attribute is an operation attribute: See below

91 Object (Job, Printer, etc. if bound to an object): Printer (already in IPP/1.0 and IPP/1.1)

92 Attribute syntax(es) (include 1setOf and range as in Section 4.2): text(127)

93

94 Specification of this attribute (follow the style of IPP Model Section 4.2):

95

96 "printer-message-from-operator" (text(127))

97 The client OPTIONALLY supplies this attribute. The Printer object SHOULD supports this
98 operation attribute if it supports the corresponding Printer Description attribute. The value of this
99 attribute is a message from the operator about the Printer object on which the operator has just
100 performed an operation. If supported, the Printer copies the value to the Printer's "printer-message-
101 from-operator" Printer Description attribute (see [ipp-mod] section 4.4.25). If the client omits this
102 attribute, the Printer either removes the attribute from the Printer or sets the attribute to the zero-
103 length string, depending on implementation.

104

105 This operation attribute is defined for use with the following operator operations on the Printer object:

106 Pause-Printer - see [ipp-mod] section 3.2.7

107 Resume-Printer - see [ipp-mod] section 3.2.8

108 Purge-Jobs - see [ipp-mod] section 3.2.9

109 Disable-Printer - see section 4.1.2

110 Enable-Printer - see section 4.1.3

111 Shutdown-Printer - see section 4.1.4

112

113 The "printer-message-from-operator" operation attribute MUST NOT be supported as an operation attribute
114 for the Set-Printer-Attributes operation. If the operator wants to set the Printer's "printer-message-from-

115 operator" Printer Description attribute when issuing the Set-Printer-Attributes operation, the client supplies
116 the "printer-message-from-operator" with its new value as one of the Printer Description attributes in Group
117 2 in the request. Otherwise the Printer leaves the value of the Printer's "printer-message-from-operator"
118 Printer Description attribute unchanged by not explicitly setting the attribute.

119 2.2 New operation attribute: "job-message-from-operator" (text(127))

120 Type of registration: attribute

121 Proposed keyword name of this attribute: "job-message-from-operator"

122 Types of attribute (Operation, Job Template, Job Description, Printer Description): Operation

123 Operations to be used with if the attribute is an operation attribute: See below

124 Object (Job, Printer, etc. if bound to an object): Job (already in IPP/1.0 and IPP/1.1)

125 Attribute syntax(es) (include 1setOf and range as in Section 4.2): text(127)

126

127 Specification of this attribute (follow the style of IPP Model Section 4.2):

128

129 "job-message-from-operator" (text(127))

130 The client OPTIONALLY supplies this attribute. The Printer object SHOULD supports this
131 operation attribute if it supports the corresponding Job Description attribute. The value of this
132 attribute is a message from the operator about the Job object on which the operator has just
133 performed an operation. If supported, the Printer copies the value to the Job's "job-message-from-
134 operator" Job Description attribute (see [ipp-mod] section 4.3.16). If the client omits this attribute,
135 the Printer either removes the attribute from the Job object or sets the attribute to the zero-length
136 string, depending on implementation.

137

138 This operation attribute is defined for use with the following operator operations on the Job object:

139 Cancel-Job - see [ipp-mod] section 3.2.4

140 Hold-Job - see [ipp-mod] section 3.3.5

141 Release-Job - see [ipp-mod] section 3.3.6

142 Restart-Job - see [ipp-mod] section 3.3.7

143 Reprocess-Job - see section 4.2.2

144 Cancel-Current-Job - see section 4.2.3

145 Space-Current-Job - see section 4.2.4

146

147 The "job-message-from-operator" operation attribute MUST NOT be supported as an operation attribute for
148 the Set-Job-Attributes operation. If the operator wants to set the Job's "job-message-from-operator" Job
149 Description attribute when issuing the Set-Job-Attributes operation, the client supplies the "job-message-
150 from-operator" with its new value as one of the Job Description attributes in Group 2 in the request.
151 Otherwise the Printer leaves the value of the Job's "job-message-from-operator" Job Description attribute
152 unchanged by not explicitly setting the attribute.

153 3. New status code: 'client-error-attributes-not-settable'

154 Type of registration: status code

155 Keyword symbolic name of this status code value: 'client-error-attributes-not-settable'

156 Numeric value (to be assigned by the IPP Designated Expert in consultation with IANA):

157 Operations that this status code may be used with: Set-Printer-Attributes, Set-Job-Attributes

158 Specification of this status code (follow the style of IPP Model Section 13 APPENDIX B: Status Codes
159 and Suggested Status Code Messages):

160 13.1.4.20 client-error-attributes-not-settable (0x0413)

161 In a Set-Printer-Attributes or Set-Job-Attributes request, if the Printer object does not support one or more
162 attributes as settable, and the client supplied the "ipp-attributes-fidelity" operation attribute with the 'true'
163 value, the Printer object MUST return this status code. The Printer object MUST also return in the
164 Unsupported Attributes Group all the attributes and/or values supplied by the client that are not settable.
165 See [ipp-mod] section 3.1.7. For example, if the request indicates 'job-state', all implementations MUST
166 reject the request. As another example, if the request indicates an attribute that is supported, but not
167 settable by this implementation, such as, say, "printer-name", the implementation rejects the request. If the
168 "ipp-attribute-fidelity" attribute is 'false', the Printer MUST ignore attributes that are not settable, rather
169 than reject the request and return this status code.

170 4. Summary of Administrative operations and Operation-Id Assignments

171 The Administrative operations are summarized in the following table:

Operation Name	Operation-Id	Brief description
Set-Printer-Attributes	0x??	Sets attribute values of the Printer object
Enable-Printer	0x??	Allows the Printer to accept create job operations
Disable-Printer	0x??	Prevents the Printer from accepting create job operations
Shutdown-Printer	0x??	Shuts the Printer down in several ways
Set-Job-Attributes	0x??	Sets attribute values of the Job object
Reprocess-Job	0x??	Creates a copy of a completed job with a new Job ID and processes it
Cancel-Current-Job	0x??	Cancels the current job on the Printer
Space-Current-Job ISSUE 1: better name?	0x??	Skips or repeats some number of impressions for current job on the Printer

172 All of the operations in this registration proposal specification are OPTIONAL for an IPP object to support.
173 Unless the specification of an OPTIONAL operation requires support of another OPTIONAL operation,
174 conforming implementations may support any combination of these operations.

175 4.1 Printer Operations

176 All Printer operations are directed at Printer objects. A client **MUST** always supply the "printer-uri"
177 operation attribute in order to identify the correct target of the operation. These descriptions assume all of
178 the common semantics of IPP/1.1 Model and Semantics [ipp-mod].

179 4.1.1 Set-Printer-Attributes Operation

180 Type of registration: operation

181 Proposed name of this operation: Set-Printer-Attributes

182 Object Target: Printer

183 Specification of this operation:

184 This **OPTIONAL** operation allows a client to set the values of the attributes of a Printer object. In the
185 request, the client supplies the set of Printer attribute names and values that are to be set. In the response,
186 the Printer object returns success or rejects the request with indications of which attribute or attributes
187 could not be set.

188 How the Printer object validates the client-supplied attributes in the Set-Printer-Attributes request is
189 implementation-dependent, since there are no corresponding Printer attributes that specify the allowed
190 values that may be set on the Printer object.

191 The Printer **MUST** accept this operation in any state, i.e., for any of the values of the Printer object's
192 "printer-state" attribute.

193 For Printer attributes that are supported, some **MUST** be settable, some **SHOULD** be settable, some **MAY**
194 be settable, and some **MUST NOT** be settable as indicated in the following table:

IPP Printer Attributes	Settable?
all Job Template Default attributes ("xxx-default" [ipp-mod] section 4.2 and extensions)	SHOULD if attribute supported
all Job Template Supported attributes ("xxx-supported" [ipp-mod] section 4.2 and extensions)	SHOULD if attribute supported
all Job Template Ready attributes ("xxx-ready" [ipp-mod] section 4.2 and extensions)	SHOULD if attribute supported
printer-uri-supported	SHOULD
uri-security-supported	SHOULD
uri-authentication-supported	SHOULD
printer-name	MAY
printer-location	SHOULD if attribute supported
printer-info	SHOULD if attribute supported
printer-driver-installer	SHOULD if attribute supported
printer-make-and-model	MAY
printer-more-info-manufacturer	MAY
printer-state	MUST NOT
printer-state-reasons	MUST NOT
printer-state-message	MUST NOT if attribute supported
ipp-versions-supported	MAY
operations-supported	SHOULD
ipp-multiple-document-jobs-supported	MUST NOT if attribute supported
charset-configured	SHOULD
charset-supported	MAY
natural-language-configured	SHOULD
generated-natural-language-supported	MAY
document-format-default	SHOULD
document-format-supported	SHOULD
printer-is-accepting-jobs	MUST NOT - see Enable-Printer/Disable-Printer
queued-job-count	MUST NOT
printer-message-from-operator	MUST NOT - see "printer-message-from-operator" operation attribute
	ISSUE 2: Better to set explicitly in Set-Printer-Attributes? If yes, change to "MUST if attribute supported". Operation attribute in the other admin operations only.
color-supported	MAY if attribute supported
reference-uri-schemes-supported	MAY if attribute supported
pdl-override-supported	MUST NOT
printer-up-time	MUST NOT
printer-current-time	MAY if attribute supported
multiple-operation-time-out	SHOULD if attribute supported
compression-supported	MAY
job-k-octets-supported	SHOULD if attribute supported
job-impressions-supported	SHOULD if attribute supported
job-media-sheets-supported	SHOULD if attribute supported
pages-per-minute	MAY if attribute supported
pages-per-minute-color	MAY if attribute supported

195 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must be an
 196 operator or administrator of the Printer object (see [ipp-mod] sections 1 and 8.5). Otherwise, the IPP

197 Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or
198 'client-error-not-authorized' as appropriate.

199 Most Printer attributes will require administrator privileges to set, such as "xxx-supported", while some will
200 require operator privileges only, such as "media-ready" and "printer-message-from-operator". Which
201 attributes require which privileges depends on implementation and MAY depend on site policy.

202 4.1.1.1 Set-Printer-Attributes Request

203 The following sets of attributes are part of the Set-Printer-Attributes Request:

204 Group 1: Operation Attributes

205 Natural Language and Character Set:

206 The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
207 section 3.1.4.1.

208 Target:

209 The "printer-uri" (uri) operation attribute which is the target for this operation as described in [ipp-
210 mod] section 3.1.5.

211 Requesting User Name:

212 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as
213 described in [ipp-mod] section 8.3.

214 "ipp-attribute-fidelity" (boolean):

215 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute.
216 This operation attribute is used to specify whether or not the sets are to be atomic. If 'false', or not
217 present, Printer sets what it can and returns the unset attribute/value pairs in the Unsupported
218 Attributes group. If 'true', either all supplied attributes MUST be set or the operation MUST be
219 rejected. All Printer objects MUST support both types of setting.

220 "document-format" (mimeMediaType):

221 The client SHOULD supply this attribute. The Printer object MUST support this attribute. This
222 attribute is useful for a client to select the interpreter to which the attribute modification should be
223 applied. See [ipp-mod] section 3.2.5.1 "Get-Printer-Attributes Request".

224 If the Printer object does not distinguish between different sets of supported values for each
225 different document format when validating jobs in the create and Validate-Job operations, it MUST
226 NOT distinguish between different document formats in the Set-Printer-Attributes operation. If the
227 Printer object does distinguish between different sets of supported values for each different
228 document format specified by the client, this specialization applies only to the same Printer
229 attributes as the Get-Printer-Attributes operation (see [ipp-mod] section 3.2.5.1).

230 If the client omits this "document-format" operation attribute, the Printer object MUST respond as if
231 the attribute had been supplied with the value of the Printer object's "document-format-default"

238 attribute. It is recommended that the client always supply a value for "document-format", since the
239 Printer object's "document-format-default" may be 'application/octet-stream', in which case the set
240 attributes and values are for the union of the document formats that the Printer can automatically
241 sense. For more details, see the description of the 'mimeType' attribute syntax in [ipp-mod]
242 section 4.1.9.

243

244 If the client supplies a value for the "document-format" Operation attribute that is not supported by
245 the Printer, i.e., is not among the values of the Printer object's "document-format-supported"
246 attribute, the Printer object MUST reject the operation and return the 'client-error-document-format-
247 not-supported' status code.

248

249 Group 2: Printer Attributes

250 The client MUST supply a set of Printer attributes as defined in [ipp-mod] section 4.2 Job Template
251 Attributes ("xxx-default", "xxx-supported", and "xxx-ready" attributes) and section 4.4 Printer
252 Description Attributes. Each Printer attribute supplied in Group 2 replaces the value(s) of the
253 corresponding Printer attribute on the target Printer object. If a Printer object attribute had not been
254 configured yet and so had the 'no-value' out-of-band value (see [ipp-mod] 4.1), the supplied value(s)
255 replace the 'no-value' value. For attributes that can have multiple values (1setOf), all values
256 supplied by the client replace all values of the corresponding Printer object attribute.

257

258 4.1.1.2 Set-Printer-Attributes Response

259 The Printer object returns the following sets of attributes as part of the Get-Printer-Attributes Response:

260 Group 1: Operation Attributes

261 Status Message:

262 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY
263 includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation
264 attribute as described in [ipp-mod] sections 13 and 3.1.6.

265

266 Natural Language and Character Set:

267 The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
268 section 3.1.4.2.

269

270 Group 2: Unsupported Attributes

271 See [ipp-mod] section 3.1.7 for details on returning Unsupported Attributes.

272

273 In the case of attributes that are supported, but are not settable by the implementation (see table
274 above), the Printer object returns the client-supplied attribute(s) with a substituted value of 'not-
275 settable'. This value's syntax type is "out-of-band" and its encoding is defined by special rules for
276 "out-of-band" values in the "Encoding and Transport" document [IPP-PRO]. Its value indicates that

277 the attribute is not settable. Group 2 is returned independent of the value for the "ipp-attribute-
278 fidelity" attribute supplied by the client.

279

280 **ISSUE 3: Should we add a Group 3: Printer Object Attributes which returns the previous values for any**
281 **attributes set?**

282 4.1.2 Disable-Printer Operation

283 Type of registration: operation

284 Proposed name of this operation: Disable-Printer

285 Object Target: Printer

286 Specification of this operation:

287 This OPTIONAL operation allows a client to stop the Printer object from accepting jobs, i.e., cause the
288 Printer to reject subsequent create job operations (Print-Job, Print-URI, and Create-Job operation) and
289 return the 'server-error-not-accepting-jobs' status code. The Printer still accepts all other operations. All
290 previously submitted Jobs and currently processing Jobs continue unaffected. The Printer sets the value of
291 its "printer-is-accepting-jobs" read-only Printer Description attribute to 'false' (see [ipp-mod] section
292 4.4.20), no matter what the previous value was. This operation has no immediate effect on the Printer's
293 "printer-state" and "printer-state-reasons" attributes.

294 Note: Use the Enable-Printer operation (section 4.1.3) to enable a Printer to accept Jobs again.

295 If the Disable-Printer operation is supported, then the Enable-Printer operation MUST be supported, and
296 vice-versa.

297 Note: Use the Enable-Printer and Disable-Printer operations to allow or prevent input to a Printer. Use the
298 Pause-Printer and Resume-Printer operations to prevent or allow output from the Printer.

299 Whether or not the Disable-Printer operation stops jobs that are submitted using job submission protocols
300 other than IPP, depends on implementation, i.e., on whether the IPP protocol is being used as a universal
301 management protocol or just to manage IPP jobs, respectively.

302 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must be an
303 operator or administrator of the Printer object (see [ipp-mod] Sections 1 and 8.5). Otherwise, the IPP
304 Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or
305 'client-error-not-authorized' as appropriate.

306 The Disable-Printer Request and Disable-Printer Response have the same attribute groups and attributes as
307 the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new "printer-
308 message-from-operator" operation attribute (see section 2.1).

309 4.1.3 Enable-Printer Operation

310 Type of registration: operation

311 Proposed name of this operation: Enable-Printer

312 Object Target: Printer

313 Specification of this operation:

314 This OPTIONAL operation allows a client to start the Printer object accepting jobs, i.e., cause the Printer to
315 accept subsequent create job operations (Print-Job, Print-URI, and Create-Job operation). The Printer still
316 accepts all other operations. All previously submitted Jobs and currently processing Jobs continue
317 unaffected. The Printer sets the value of its "printer-is-accepting-jobs" read-only Printer Description
318 attribute to 'true' (see [ipp-mod] section 4.4.20), no matter what the previous value was. This operation has
319 no immediate effect on the Printer's "printer-state" and "printer-state-reasons" attributes.

320 Note: Use the Disable-Printer operation (section 4.1.2) to stop a Printer from accepting Jobs.

321 If the Enable-Printer operation is supported, then the Disable-Printer operation MUST be supported, and
322 vice-versa.

323 Note: Use the Enable-Printer and Disable-Printer operations to allow or prevent input to a Printer. Use the
324 Pause-Printer and Resume-Printer operations to prevent or allow output from the Printer.

325 Whether or not the Enable-Printer operation allows acceptance of jobs that are submitted using job
326 submission protocols other than IPP, depends on implementation, i.e., on whether the IPP protocol is being
327 used as a universal management protocol or just to manage IPP jobs, respectively.

328 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must be an
329 operator or administrator of the Printer object (see [ipp-mod] Sections 1 and 8.5). Otherwise, the IPP
330 Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or
331 'client-error-not-authorized' as appropriate.

332 The Enable-Printer Request and Enable-Printer Response have the same attribute groups and attributes as
333 the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new "printer-
334 message-from-operator" operation attribute (see section 2.1).

335 4.1.4 Shutdown-Printer Operation

336 Type of registration: operation

337 Proposed name of this operation: Enable-Printer

338 Object Target: Printer

339 Specification of this operation:

340 This OPTIONAL operation allows a client to shut down a Printer, i.e., stop processing jobs and terminating
341 all communications with the Printer. The Printer adds the 'shutdown' value (see [ipp-mod] section 4.4.11)
342 to its "printer-state-reasons" Printer Description attribute immediately. The Printer is disabled immediately
343 (see the Disable-Printer operation in section 4.1.2). The "when" operation attribute specifies how much
344 processing occurs before the shutdown takes place. All other requests continue to be accepted until the
345 printer is shutdown.

346 Whether or not the Shutdown-Printer operation affects jobs that were submitted to the device using job
347 submission protocols other than IPP, depends on implementation, i.e., on whether the IPP protocol is being
348 used as a universal management protocol or just to manage IPP jobs, respectively.

349 The Printer object MUST accept this operation in any state and transition the Printer object to the 'idle'
350 state.

351 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must be an
352 operator or administrator of the Printer object (see [ipp-mod] sections 1 and 8.5). Otherwise, the IPP object
353 MUST reject the operation and return: client-error-forbidden, client-error-not-authenticated, and client-
354 error-not-authorized as appropriate.

355 The Shutdown-Printer Request and Shutdown-Printer Response have the same attribute groups and
356 attributes as the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new
357 "printer-message-from-operator" operation attribute (see section 2.1), and with the addition of the following
358 Group 1 operation attributes in the request:

359 "when" (type2 keyword)

360 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute, if
361 it supports this operation. The value of this attribute indicates when to shutdown the printer. If the
362 client omits this attribute, the Printer assumes the 'after-current' value.

363
364 Standard keyword values are:

365 'now' - cancel the currently printing job(s) and shut down the Printer. Jobs in the 'held' and
366 'pending' state remain in those states.

367 'after-current' - shutdown the Printer after the current job finishes printing. Jobs in the 'held'
368 and 'pending' state remain in those states.

369 'after-all' - shutdown the Printer after all 'pending' jobs finish printing. Jobs in the 'held' state
370 remain in the 'held' state.

371
372 "non-process-run-out" (boolean)

373 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this
374 attribute. This attribute indicates whether or not the printer is to perform "non-process run-out", i.e.,
375 move the last printed sheet to the stacker, before shutting down.

376 **ISSUE 4: What behavior if the client omits this attributes?**

377 **ISSUE 5: What behavior if the implementation does not support this attribute?**

378
379 "synchronize" (boolean)

380 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this
381 attribute. This attribute indicates whether or not the printer is to synchronize the checkpoint data for
382 the current job with the pages that have actually printed. If this attribute is supported, then a value
383 of 'true' implies that the Printer will be able to resume the job at the point of synchronization when
384 the Printer is restarted.

385 **ISSUE 6: Is the current job automatically restarted when the Printer is restarted? Or does some**
386 **client have to issue a Restart-Job operation?**

387 4.2 Job Operations

388 All Job operations are directed at Job objects. A client MUST always supply some means of identifying the
389 Job object in order to identify the correct target of the operation. That job identification MAY either be a

390 single Job URI or a combination of a Printer URI with a Job ID. The IPP object implementation MUST
 391 support both forms of identification for every job.

392 4.2.1 Set-Job-Attributes

393 Type of registration: operation
 394 Proposed name of this operation: Set-Job-Attributes
 395 Object Target: Job
 396 Specification of this operation:

397 This OPTIONAL operation allows a client to set the values of the attributes of a Job object. In the request,
 398 the client supplies the set of Job attribute names and values that are to be set. In the response, the IPP
 399 object returns success or rejects the request with indications of which attribute or attributes could not be set.

400 This operation is almost identical to the Set-Printer-Attributes operation (see section 4.1.1). The only
 401 differences are that the operation is directed at a Job object rather than a Printer object, there is no
 402 "document-format" operation attribute used when setting a Job object, and the validation is the same as the
 403 create job operations, i.e., depend on the "xxx-supported" Printer Description attributes.

404 The validation of the Set-Job-Attributes request is performed as if the job had been submitted originally
 405 with the new values. If such a create job operation would have been accepted, then the Set-Job-Attributes
 406 MUST be accepted. If such a create job operation would have been rejected, then the Set-Job-Attributes
 407 MUST be rejected and the Job MUST be unchanged.

408 The IPP object MUST accept or reject the request based on the job's current state and transition the job to
 409 the indicated new state as follows:

Current "job-state"	New "job-state"	IPP object's response status code and action:
'pending'	'pending'	'successful-ok'
'pending'	'pending-held'	'successful-ok' - needed resources are not ready
'pending-held'	'pending-held'	'successful-ok'
'pending-held'	'pending'	'successful-ok' - needed resources are ready
'processing'	'processing'	'successful-ok' or 'client-error-not-possible'
		depending on the attributes being set, whether the job has started marking media, and/or implementation
'processing-stopped'	'processing-stopped'	'successful-ok' or 'client-error-not-possible'
		depending on the attributes being set, whether the job has started marking media, and/or implementation
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

410 For Job attributes that are supported, some MUST be settable, some SHOULD be settable, some MAY be
 411 settable, and some MUST NOT be settable as indicated in the following table:

IPP Job Attributes	Settable?
all Job Template Job attributes ("xxx" [ipp-mod] section 4.2 and extensions)	SHOULD if attribute supported
job-uri	MUST NOT
job-id	MUST NOT
job-printer-uri	MUST NOT
job-more-info	MUST NOT if attribute supported
job-name	MUST - also set in create operation
job-originating-user-name	MUST NOT - set in create operation
job-state	MUST NOT
job-state-reasons	MUST NOT
job-state-message	MUST NOT if attribute supported
number-of-documents	MUST NOT
output-device-assigned	MUST NOT
time-at-creation	MUST NOT
time-at-processing	MUST NOT
time-at-completed	MUST NOT
job-printer-up-time	MUST NOT
date-time-at-creation	MUST NOT if attribute supported
date-time-at-processing	MUST NOT if attribute supported
date-time-at-completed	MUST NOT if attribute supported
number-of-intervening-jobs	MUST NOT if attribute supported
job-message-from-operator	MUST if attribute supported and if operator
job-k-octets	MUST NOT if attribute supported
job-impressions	MAY if attribute supported - see Rule 1
job-media-sheets	MAY if attribute supported - see Rule 1
job-k-octets-processed	MUST NOT if attribute supported
job-impressions-completed	MUST NOT if attribute supported
job-media-sheets-completed	MUST NOT if attribute supported
attributes-charset	MUST NOT - set in create operation
attributes-natural-language	MUST NOT - set in create operation

412 Rule 1 - However, an implementation MAY refuse to allow this Job Description attribute to be set, if it has
 413 determined a more reliable value from the document content.

414 Whether or not the Set-Job-Attributes operation affects jobs that are submitted using job submission
 415 protocols other than IPP, depends on implementation, i.e., on whether the IPP protocol is being used as a
 416 universal management protocol or just to manage IPP jobs, respectively.

417 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must either be
 418 the job owner or an operator or administrator of the Printer object (see [ipp-mod] sections 1 and 8.5).
 419 Otherwise, the IPP object MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-
 420 authenticated', or 'client-error-not-authorized' as appropriate.

421 4.2.1.1 Set-Job-Attributes Request

422 The following sets of attributes are part of the Set-Printer-Attributes Request:

423 Group 1: Operation Attributes

424 Natural Language and Character Set:

425 The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
426 section 3.1.4.1.

427

428 Target:

429 The "printer-uri" (uri) operation attribute which is the target for this operation as described in [ipp-
430 mod] section 3.1.5.

431

432 Requesting User Name:

433 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as
434 described in [ipp-mod] section 8.3.

435

436 "ipp-attribute-fidelity" (boolean):

437 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute if
438 it supports this operation. This operation attribute is used to specify whether or not the sets are to be
439 atomic. If 'false', or not present, Printer sets what it can and returns the unset attribute/value pairs in
440 the Unsupported Attributes group. If 'true', either all supplied attributes MUST be set or the
441 operation MUST be rejected. All Printer objects MUST support both types of setting. See [ipp-
442 mod] section 15 for a full description of "ipp-attribute-fidelity" and its relationship to other
443 attributes, especially the Printer object's "pdl-override-supported" attribute.

444

445 Group 2: Printer Attributes

446 The client MUST supply a set of Job attributes as defined in [ipp-mod] section 4.2 Job Template
447 Attributes ("xxx" attributes) and section 4.3 Job Description Attributes. Each Job attribute supplied
448 in Group 2 replaces the value(s) of the corresponding Job attribute on the target Job object. For
449 attributes that can have multiple values (1setOf), all values supplied by the client replace all values
450 of the corresponding Printer object attribute.

451

452 4.2.1.2 Set-Job-Attributes Response

453 The Printer object returns the following sets of attributes as part of the Get-Job-Attributes Response:

454 Group 1: Operation Attributes

455 Status Message:

456 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY
457 includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation
458 attribute as described in [ipp-mod] sections 13 and 3.1.6.

459

460 Natural Language and Character Set:

461 The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
462 section 3.1.4.2.

463

464 Group 2: Unsupported Attributes

465 See [ipp-mod] section 3.1.7 for details on returning Unsupported Attributes.

466

467 The attributes returned are the same as for the create operation with the same new attribute values.
468 However, in the case of attributes that are supported, but are not settable by the implementation (see
469 table above), the Printer object returns the client-supplied attribute(s) with a substituted value of
470 'not-settable'. This value's syntax type is "out-of-band" and its encoding is defined by special rules
471 for "out-of-band" values in the "Encoding and Transport" document [IPP-PRO]. Its value indicates
472 that the attribute is not settable.

473

474 Group 2 is returned independent of the value for the "ipp-attribute-fidelity" attribute supplied by the
475 client. However, if "ipp-attribute-fidelity" is 'true', the 'client-error-attributes-not-settable' status
476 code is returned. If "ipp-attribute-fidelity" is 'false', the 'successful-ok-ignored-or-substituted-
477 attributes' status code is returned.

478

479 **ISSUE 7: Should we add a Group 3: Printer Object Attributes which returns the previous values for any**
480 **attributes set?**

481 4.2.2 Reprocess-Job Operation

482 This OPTIONAL operation allows a client to re-process a copy of a job that is retained in the queue after
483 processing has completed (see [ipp-mod] section 4.3.7.2). This operation is the same as the Restart-Job
484 operation (see [ipp-mod] section 3.3.7), except that the Printer creates a new job that is a copy of the
485 identified job and the identified job is unchanged. The new job is assigned new values to the "job-uri" and
486 "job-id" attributes. The identified job moves to the Job History after a suitable period, independent of
487 whether one or more Reprocess-Job operations have been performed on it.

488 If the Set-Job-Attributes operation is supported, then the "job-hold-until" operation attribute MUST be
489 supported with at least the 'indefinite' value, so that a client can modify the new job before it is scheduled
490 for processing using the Set-Job-Attributes operation. After modifying the job, the client can release the
491 job for processing, by using the Release-Job operation specifying the newly assigned "job-uri" or "job-id"
492 for the new job.

493 4.2.3 Cancel-Current-Job Operation

494 This OPTIONAL operation allows a client to cancel the current job on the target Printer. Since a Job might
495 already be marking by the time a Cancel-Current-Job is received, some media sheet pages might be printed
496 before the job is actually terminated.

497 If there are no jobs in the 'processing' or 'processing-stopped' states, the Printer rejects the request and
498 returns the 'client-error-not-possible' status code. Otherwise, the Printer MUST perform the Cancel-
499 Current-Job request, as if the client had supplied the "job-uri" or the "job-id" of the current job in a Cancel-
500 Job operation. If more than one job is in the 'processing' or 'processing-stopped' states, the one that is
501 marking is canceled and the others are unaffected.

502 Warning: On a shared printer, there is a race condition. Between the time that a user issues this operation
503 and its acceptance, the current job might change to a different job. If the user is authenticated to cancel the
504 new job, the wrong job is canceled.

505 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must either be
506 the job owner of the current job or an operator or administrator of the Printer object (see [ipp-mod] sections
507 1 and 8.5). Otherwise, the IPP object MUST reject the operation and return: 'client-error-forbidden', 'client-
508 error-not-authenticated', or 'client-error-not-authorized' as appropriate.

509 The Cancel-Current-Job Request and Cancel-Current-Job Response have the same attribute groups and
510 attributes as the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new
511 "job-message-from-operator" operation attribute (see [ipp-mod] section 2.2), with the addition of the
512 following Group 1 Operation attribute in the request:

513 "non-process-run-out" (boolean):

514 The client OPTIONALLY supplies this Operation attribute. The IPP object OPTIONALLY
515 supports this operation attribute, if it is able to perform a non-process-run-out, i.e., remove the last
516 few printed sheets of a job that is finished printing on a continuous-forms printer. Normally, on
517 such a printer, the last sheets of a job remain in the printer and are forced out by the next job,
518 thereby saving time when printing one job after another. However, when shutting done the Printer
519 is it desirable to remove the end of the last job.

520 **ISSUE 8: What behavior if the client omits this attributes?**

521 **ISSUE 9: What behavior if the implementation does not support this attribute?**

522 **ISSUE 10: Why is this automatic on a continuous form printer? When would an operator want to**
523 **shutdown the Printer and NOT run out the last sheets. It would be simpler to require process-run-**
524 **out when shutting down (for continuous and cut sheet printers).**

525 "synchronize" (boolean):

526 The client OPTIONALLY supplies this Operation attribute. The IPP object OPTIONALLY
527 supports this operation attribute, if it is able to synchronize the data, i.e., synchronize the checkpoint
528 data for the current job with the pages that have actually printed. If this attribute is supported, a
529 value of 'true' causes the Printer to resume the job at the point of synchronization when the Printer is
530 restarted.

531 **ISSUE 11: Should we define a Restart-Printer operation?**

532 **ISSUE 12: What behavior if the client omits this attributes?**

533 **ISSUE 13: What behavior if the implementation does not support this attribute?**

534 **ISSUE 14: What does this attribute mean when the "when" attribute is 'after-current' or 'after-all'?**
535 **Or should this be a new value for "when", i.e., 'after-synchronization' so it is only used when**
536 **shutting down the Printer in the middle of the current job?**

537 4.2.4 Space-Current-Job operation

538 This OPTIONAL operation allows a client to repeat or skip a specified number of impressions for the
539 current job on the target Printer. This operation is typically supported in a continuous forms
540 implementation for synchronizing the web after forms run out or media change.

541 If there are no jobs in the 'processing' or 'processing-stopped' states, the Printer rejects the request and
542 returns the 'client-error-not-possible' status code. Otherwise, the Printer repeats or skips the indicated
543 number of impressions specified by the "back-space" or "forward-space" operation attribute, respectively.

544 Warning: On a shared printer, there is a race condition. Between the time that a user issues this operation
545 and its acceptance, the current job might change to a different job. If the user is authenticated to space the
546 new job, the wrong job is spaced.

547 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must either be
548 the job owner of the current job or an operator or administrator of the Printer object (see [ipp-mod] sections
549 1 and 8.5). Otherwise, the IPP object MUST reject the operation and return: 'client-error-forbidden', 'client-
550 error-not-authenticated', or 'client-error-not-authorized' as appropriate.

551 The Space-Current-Job Request and Space-Current-Job Response have the same attribute groups and
552 attributes as the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new
553 "job-message-from-operator" operation attribute (see [ipp-mod] section 2.2), with the addition of the
554 following Group 1 Operation attribute in the request:

555 "back-space" (integer(1:MAX)):

556 The client OPTIONALLY supplies this Operation attribute. The IPP object OPTIONALLY
557 supports this operation attribute, if it is able to repeat impressions.

558 If the client supplies a value that specifies more impressions than the job has performed, the job is
559 positioned at the beginning without any indication.

560 "forward-space" (integer(1:MAX)):

561 The client OPTIONALLY supplies this Operation attribute. The IPP object OPTIONALLY
562 supports this operation attribute, if it is able to skip impressions.

563 If the client supplies a value that specifies more impressions than remain in the job, the job is
564 positioned at the end without any indication.

565 "non-process-run-out" (boolean):

566 The client OPTIONALLY supplies this Operation attribute. The IPP object OPTIONALLY
567 supports this operation attribute, if it is able to perform a non-process-run-out, i.e., remove the last
568 few printed sheets of a job that is finished printing on a continuous-forms printer. Normally, on
569 such a printer, the last sheets of a job remain in the printer and are forced out by the next job,
570 thereby saving time when printing one job after another. However, when backspacing or advance
571 the Printer is it desirable to be able to specify whether or not to force out the most recently printed
572 sheets. **ISSUE 15: Correct?**

