

1 PWG-DRAFT - 13 ISSUES are numbered and highlighted like this  
2 ipp-ops-admin-990630.txt

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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 and 6/30/1999.

13 Abstract

14 This document specifies 15 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 7  
16 Printer object operations that operators/administrators may perform on a Printer object:

17 Set-Printer-Attributes  
18 Enable-Printer  
19 Disable-Printer  
20 Reset-Printer  
21 Restart-Printer  
22 Space-Printer  
23 Shutdown-Printer

24 and 8 Job object operations that end-users may perform on their jobs and operators/administrators may  
25 perform on any job:

26 Set-Job-Attributes  
27 Reprocess-Job  
28 Cancel-Current-Job (though the target is the Printer object)  
29 Pause-Job  
30 Pause-Current-Job (though the target is the Printer object)  
31 Resume-Job  
32 Promote-Job  
33 Space-Current-Job (though the target is the Printer object)

34 In addition, two operation attributes are defined: "job-message-from-operator" and "printer-message-from-  
35 operator" are included to set the corresponding Job and Printer Description attributes with the same names.  
36 And the "when" operation attribute is added to the Pause-Printer operation.

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

38 The full set of IPP documents includes:

- 39 Design Goals for an Internet Printing Protocol [RFC2567]
- 40 Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]
- 41 Internet Printing Protocol/1.1: Model and Semantics (this document)
- 42 Internet Printing Protocol/1.1: Encoding and Transport [IPP-PRO]
- 43 Internet Printing Protocol/1.1: Implementer's Guide [IPP-IIG]
- 44 Mapping between LPD and IPP Protocols [RFC2569]

45

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

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

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

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

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

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97  
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99  
100  
101

## Table of Contents

- 1. Introduction .....4
- 2. New Operation attributes .....4
  - 2.1 New operation attribute: "printer-message-from-operator" (text(127)).....4
  - 2.2 New operation attribute: "job-message-from-operator" (text(127)) .....5
  - 2.3 New operation attribute for Pause-Printer: "when" (type2 keyword) .....6
- 3. New Attributes .....6
  - 3.1 New Printer Description attribute: "printer-message-date-time" (dateTime) .....7
  - 3.2 New Printer Description attribute: "printer-message-operation" (type2 keyword).....7
- 4. Additional values for "printer-state-reasons" and "job-state-reasons" attributes .....8
  - 4.1 Value for "printer-state-reasons": 'standby' .....8
  - 4.2 Value for "job-state-reasons": 'job-paused' .....8
  - 4.3 Value for "job-state-reasons": 'process-next' .....8
- 5. New status codes .....8
  - 5.1 New status code: 'client-error-attributes-not-settable' .....8
  - 5.2 New status code: 'server-error-printer-is-in-standby-mode' .....9
- 6. Summary of Administrative operations and Operation-Id Assignments.....9
  - 6.1 Printer Operations .....10
    - 6.1.1 Set-Printer-Attributes Operation .....10
    - 6.1.2 Disable-Printer Operation .....15
    - 6.1.3 Enable-Printer Operation .....15
    - 6.1.4 Reset-Printer operation .....16
    - 6.1.5 Restart-Printer operation .....17
    - 6.1.6 Space-Printer operation.....18
    - 6.1.7 Shutdown-Printer Operation .....19
  - 6.2 Job Operations .....21
    - 6.2.1 Set-Job-Attributes .....21
    - 6.2.2 Reprocess-Job Operation .....25
    - 6.2.3 Cancel-Current-Job Operation .....25
    - 6.2.4 Pause-Job operation .....26
    - 6.2.5 Pause-Current-Job operation.....28
    - 6.2.6 Resume-Job operation.....29
    - 6.2.7 Promote-Job operation .....29
    - 6.2.8 Space-Current-Job operation .....30

## 102 1. Introduction

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

## 108 2. New Operation attributes

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

## 111 2.1 New operation attribute: "printer-message-from-operator" (text(127))

112 Type of registration: attribute

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

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

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

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

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

118

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

120

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

122 The client OPTIONALLY supplies this attribute. The Printer object SHOULD supports this  
123 operation attribute if it supports the corresponding Printer Description attribute. The value of this  
124 attribute is a message from the operator about the Printer object on which the operator has just  
125 performed an operation. If supported, the Printer copies the value to the Printer's "printer-message-  
126 from-operator" Printer Description attribute (see [ipp-mod] section 4.4.25), automatically sets the  
127 value of the Printer's "printer-message-date-time" to the current date and time, and automatically sets  
128 the value of the Printer's "printer-message-operation" to the operation-id value of this operation. If  
129 the client omits this attribute, the Printer does not change the value of its "printer-message-from-  
130 operator", "printer-message-date-time", and "printer-message-operation" Printer Description  
131 attributes.

132

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

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

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

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

137 Disable-Printer - see section 6.1.2

138 Enable-Printer - see section 6.1.3

139 Reset-Printer - see section 6.1.4

140 Restart-Printer - see section 6.1.5  
141 Space-Printer - see section 6.1.6  
142 Shutdown-Printer - see section 6.1.7  
143

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

150 2.2 New operation attribute: "job-message-from-operator" (text(127))

151 Type of registration: attribute  
152 Proposed keyword name of this attribute: "job-message-from-operator"  
153 Types of attribute (Operation, Job Template, Job Description, Printer Description): Operation  
154 Operations to be used with if the attribute is an operation attribute: See below  
155 Object (Job, Printer, etc. if bound to an object): Job (already in IPP/1.0 and IPP/1.1)  
156 Attribute syntax(es) (include 1setOf and range as in Section 4.2): text(127)  
157

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

159  
160 "job-message-from-operator" (text(127))

161 The client OPTIONALLY supplies this attribute. The Printer object SHOULD supports this  
162 operation attribute if it supports the corresponding Job Description attribute. The value of this  
163 attribute is a message from the operator about the Job object on which the operator has just  
164 performed an operation. If supported, the Printer copies the value to the Job's "job-message-from-  
165 operator" Job Description attribute (see [ipp-mod] section 4.3.16). If the client omits this attribute,  
166 the Printer does not change the value of its "printer-message-from-operator" Job Description  
167 attribute.  
168

169 Note: There are no corresponding "job-message-date-time" and "job-message-operation" Job  
170 Description attributes, since the usual lifetime of a job is limited.  
171

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

173 Cancel-Job - see [ipp-mod] section 3.2.4  
174 Hold-Job - see [ipp-mod] section 3.3.5  
175 Release-Job - see [ipp-mod] section 3.3.6  
176 Restart-Job - see [ipp-mod] section 3.3.7  
177 Reprocess-Job - see section 6.2.2  
178 Cancel-Current-Job - see section 6.2.3  
179 Pause-Job - see section 6.2.4  
180 Pause-Current-Job - see section 6.2.5

181 Resume-Job - see section 6.2.6  
182 Promote-Job - see section 6.2.7  
183 Space-Current-Job - see section 6.2.8  
184

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

191 2.3 New operation attribute for Pause-Printer: "when" (type2 keyword)

192 Type of registration: attribute  
193 Proposed keyword name of this attribute: "when"  
194 Types of attribute (Operation, Job Template, Job Description, Printer Description): Operation  
195 Operations to be used with if the attribute is an operation attribute: Pause-Printer, Reset-Printer, Shutdown-  
196 Printer  
197 Object (Job, Printer, etc. if bound to an object): Job (already in IPP/1.0 and IPP/1.1)  
198 Attribute syntax(es) (include 1setOf and range as in Section 4.2): type2 keyword  
199

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

201 "when" (type2 keyword)

202 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute, if  
203 it supports this operation. The value of this attribute indicates when to shutdown the printer. If the  
204 client omits this attribute, the Printer assumes the 'after-current-job' value.  
205

206 Standard keyword values are:

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

209 'after-current-copy' - shutdown the Printer after the current job finishes printing its current  
210 copy. Jobs in the 'held' and 'pending' state remain in those states.

211 'after-current-job' - shutdown the Printer after the current job finishes printing (all its copies).  
212 Jobs in the 'held' and 'pending' state remain in those states.

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

215 **ISSUE 1: Which values of the "when" operation attribute are required to be supported?**  
216

217 3. New Attributes

218 The following new attributes are needed to support the new operations defined in this document.

219 3.1 New Printer Description attribute: "printer-message-date-time" (dateTime)

220 Type of registration: attribute

221 Proposed keyword name of this attribute: printer-message-date-time

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

223 Operations to be used with if the attribute is an operation attribute: N/A

224 Object (Job, Printer, etc. if bound to an object): Printer

225 Attribute syntax(es) (include 1setOf and range as in Section 4.2): dateTime

226 If attribute syntax is 'keyword' or 'enum', is it type2 or type3: N/A

227 If this is a Printer attribute, MAY the value returned depend on "document-format" (See Section 6.2): No

228 If this is a Job Template attribute, how does its specification depend on the value of the "multiple-  
229 document-handling" attribute: N/A

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

231 4.2.? printer-message-date-time (dateTime)

232 The date and time that the Printer's "printer-message-from-operator" was changed by the operator using any  
233 operation where the client supplied the "printer-message-from-operator" operation attribute (see section 2.1)  
234 or was explicitly set using the Set-Printer-Attributes operation (see section 6.1.1). This attribute allows the  
235 users to know when the "printer-message-from-operator" attribute was last set.

236 Note: This attribute helps users better understand the context for the "printer-message-from-operator"  
237 message.

238 3.2 New Printer Description attribute: "printer-message-operation" (type2 keyword)

239 Type of registration: attribute

240 Proposed keyword name of this attribute: printer-message-operation

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

242 Operations to be used with if the attribute is an operation attribute: N/A

243 Object (Job, Printer, etc. if bound to an object): Printer

244 Attribute syntax(es) (include 1setOf and range as in Section 4.2): type2 enum

245 If attribute syntax is 'keyword' or 'enum', is it type2 or type3: type2

246 If this is a Printer attribute, MAY the value returned depend on "document-format" (See Section 6.2): No

247 If this is a Job Template attribute, how does its specification depend on the value of the "multiple-  
248 document-handling" attribute: N/A

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

250 4.2.? printer-message-attribute (type2 enum)

251 The operation that was used to changed the Printer's "printer-message-from-operator" by the operator using  
252 any operation where the client supplied the "printer-message-from-operator" operation attribute (see section  
253 2.1) or explicitly set using the Set-Printer-Attributes operation (see section 6.1.1). This attribute allows the  
254 users to know which operation was used to change the "printer-message-from-operator" attribute when it  
255 was last set.

256 Note: This attribute helps users better understand the context for the "printer-message-from-operator"  
257 message.

#### 258 4. Additional values for "printer-state-reasons" and "job-state-reasons" attributes

259 The following values are added to the "printer-state-reasons" and "job-state-reasons" for use with the  
260 operations defined in this document.

##### 261 4.1 Value for "printer-state-reasons": 'standby'

262 Type of registration: type2 keyword attribute value

263 Name of attribute to which this keyword specification is to be added: printer-state-reasons

264 Proposed keyword name of this keyword value: standby

265 Specification of this keyword value (follow the style of IPP Model Section 4.1.2.3):

266 'standby': The Printer has been shutdown in standby mode. Only Restart-Printer and Get-Printer-  
267 Attributes operations are accepted in this state; all other operations are rejected with the 'server-  
268 error-printer-is-in-standby-mode'.

##### 269 4.2 Value for "job-state-reasons": 'job-paused'

270 Type of registration: type2 keyword attribute value

271 Name of attribute to which this keyword specification is to be added: job-state-reasons

272 Proposed keyword name of this keyword value: job-paused

273 Specification of this keyword value (follow the style of IPP Model Section 4.1.2.3):

274 'job-paused': The job has been paused while processing using the Pause-Job or Pause-Current-Job  
275 operations and other jobs can be processed on the Printer. The Job can be resumed using the  
276 Resume-Job operation which removes this value.

##### 277 4.3 Value for "job-state-reasons": 'process-next'

278 Type of registration: type2 keyword attribute value

279 Name of attribute to which this keyword specification is to be added: job-state-reasons

280 Proposed keyword name of this keyword value: process-next

281 Specification of this keyword value (follow the style of IPP Model Section 4.1.2.3):

282 'process-next': The job has been promoted to be the next job processed using the Promote-Job operation  
283 (see section 6.2.7).  
284

#### 285 5. New status codes

286 This section defines new status codes used by the operations defined in this document.

##### 287 5.1 New status code: 'client-error-attributes-not-settable'

288 Type of registration: status code



289 Keyword symbolic name of this status code value: 'client-error-attributes-not-settable'  
 290 Numeric value (to be assigned by the IPP Designated Expert in consultation with IANA):  
 291 Operations that this status code may be used with: Set-Printer-Attributes, Set-Job-Attributes  
 292 Specification of this status code (follow the style of IPP Model Section 13 APPENDIX B: Status Codes  
 293 and Suggested Status Code Messages):

294 13.1.4.20 client-error-attributes-not-settable (0x0413)

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

304 5.2 New status code: 'server-error-printer-is-in-standby-mode'

305 Type of registration: status code

306 Keyword symbolic name of this status code value: 'server-error-printer-is-in-standby-mode'

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

308 Operations that this status code may be used with: Shutdown-Printer

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

311 13.1.5.8 server-error-printer-is-in-standby-mode

312 The Printer has been shutdown and is only accepting the Restart-Printer (see section 6.1.5) and Get-Printer-  
 313 Attributes operations. An operator can perform the Restart-Printer operation to allow the Printer to accept  
 314 other operations.

315 6. Summary of Administrative operations and Operation-Id Assignments

316 The Administrative operations are summarized in the following table:

Operation Name	Operation-Id	Brief description
Set-Printer-Attributes	0x??	Sets attribute values of the target Printer object
Enable-Printer	0x??	Allows the target Printer to accept create job operations
Disable-Printer	0x??	Prevents the target Printer from accepting create job operations
Reset-Printer	0x??	Resets the target Printer to one of several indicated ways
Restart-Printer	0x??	Restarts the target Printer from a standby shutdown mode

Operation Name	Operation-Id	Brief description
Space-Printer	0x??	Skips or repeats the specified number of impressions for the target job
Shutdown-Printer	0x??	Shuts down the target Printer in several ways
Set-Job-Attributes	0x??	Sets attribute values of the target Job object
Reprocess-Job	0x??	Creates a copy of a completed target job with a new Job ID and processes it
Cancel-Current-Job	0x??	Cancels the current job on the target Printer
Pause-Job	0x??	Pauses the indicated processing job, allowing other jobs to be processed instead
Pause-Current-Job	0x??	Pauses the current processing job on the target Printer
Resume-Job	0x??	Resume the paused target job
Promote-Job	0x??	Promote the pending target job to be next after the current job(s) complete
Space-Current-Job	0x??	Skips or repeats some number of impressions for the current job on the target Printer

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

## 320 6.1 Printer Operations

321 All Printer operations are directed at Printer objects. A client MUST always supply the "printer-uri"  
 322 operation attribute in order to identify the correct target of the operation. These descriptions assume all of  
 323 the common semantics of IPP/1.1 Model and Semantics document [ipp-mod] section 3.1.

### 324 6.1.1 Set-Printer-Attributes Operation

325 Type of registration: operation  
 326 Proposed name of this operation: Set-Printer-Attributes  
 327 Object Target: Printer  
 328 Specification of this operation:

329 This OPTIONAL operation allows a client to set the values of the attributes of a Printer object. In the  
 330 request, the client supplies the set of Printer attribute names and values that are to be set. In the response,  
 331 the Printer object returns success or rejects the request with indications of which attribute or attributes  
 332 could not be set.

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

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

338 For Printer attributes that are supported, some MUST be settable, some SHOULD be settable, some MAY  
339 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 if attribute supported Note: There is no "printer-message-from-operator" operation attribute for the Set-Printer-Attributes operation.
printer-message-date-time	MUST NOT if attribute supported
printer-message-operation	MUST NOT if attribute supported
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

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

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

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

#### 347 6.1.1.1 Set-Printer-Attributes Request

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

##### 349 Group 1: Operation Attributes

350 Natural Language and Character Set:

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

353

354 Target:

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

357

358 Requesting User Name:

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

361

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

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

368

369 "document-format" (mimeMediaType):

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

373

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

380

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

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

388  
389 If the client supplies a value for the "document-format" Operation attribute that is not supported by  
390 the Printer, i.e., is not among the values of the Printer object's "document-format-supported"  
391 attribute, the Printer object MUST reject the operation and return the 'client-error-document-format-  
392 not-supported' status code.  
393

#### 394 Group 2: Printer Attributes

395 The client MUST supply a set of Printer attributes as defined in [ipp-mod] section 4.2 Job Template  
396 Attributes ("xxx-default", "xxx-supported", and "xxx-ready" attributes) and section 4.4 Printer  
397 Description Attributes. Each Printer attribute supplied in Group 2 replaces the value(s) of the  
398 corresponding Printer attribute on the target Printer object. If a Printer object attribute had not been  
399 configured yet and so had the 'no-value' out-of-band value (see [ipp-mod] 4.1), the supplied value(s)  
400 replace the 'no-value' value. For attributes that can have multiple values (1setOf), all values  
401 supplied by the client replace all values of the corresponding Printer object attribute.  
402

#### 403 6.1.1.2 Set-Printer-Attributes Response

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

##### 405 Group 1: Operation Attributes

###### 406 Status Message:

407 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY  
408 includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation  
409 attribute as described in [ipp-mod] sections 13 and 3.1.6.  
410

###### 411 Natural Language and Character Set:

412 The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]  
413 section 3.1.4.2.  
414

##### 415 Group 2: Unsupported Attributes

416 See [ipp-mod] section 3.1.7 for details on returning Unsupported Attributes.  
417

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

422 the attribute is not settable. Group 2 is returned independent of the value for the "ipp-attribute-  
423 fidelity" attribute supplied by the client.  
424

### 425 6.1.2 Disable-Printer Operation

426 Type of registration: operation  
427 Proposed name of this operation: Disable-Printer  
428 Object Target: Printer  
429 Specification of this operation:

430 This OPTIONAL operation allows a client to stop the Printer object from accepting jobs, i.e., cause the  
431 Printer to reject subsequent create job operations (Print-Job, Print-URI, and Create-Job operation) and  
432 return the 'server-error-not-accepting-jobs' status code. The Printer still accepts all other operations. All  
433 previously submitted Jobs and currently processing Jobs continue unaffected. The Printer sets the value of  
434 its "printer-is-accepting-jobs" read-only Printer Description attribute to 'false' (see [ipp-mod] section  
435 4.4.20), no matter what the previous value was. This operation has no immediate effect on the Printer's  
436 "printer-state" and "printer-state-reasons" attributes.

437 Note: Use the Enable-Printer operation (section 6.1.3) to enable a Printer to accept Jobs again.

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

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

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

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

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

### 452 6.1.3 Enable-Printer Operation

453 Type of registration: operation  
454 Proposed name of this operation: Enable-Printer  
455 Object Target: Printer  
456 Specification of this operation:

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

463 Note: Use the Disable-Printer operation (section 6.1.2) to stop a Printer from accepting Jobs.

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

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

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

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

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

#### 478 6.1.4 Reset-Printer operation

479 Type of registration: operation

480 Proposed name of this operation: Reset-Printer

481 Object Target: Printer

482 Specification of this operation:

483 This OPTIONAL operation allows a client to reset the Printer in a number of ways, depending on the  
484 "reset-function" operation attribute. The keyword values of this attribute map one-to-one to the enum  
485 values that the NMS writes into the prtGeneralReset object in the Printer MIB [RFC1759] to affect a reset  
486 operation. As in the Printer MIB, the 'reset-to-nvram' (soft reset) value MUST be supported, if this  
487 operation is supported. The other values are OPTIONAL.

488 As is says in the Printer MIB specification, if a device does not have NVRAM (non-volatile RAM), the  
489 device MUST none-the-less respond to this operation for the 'reset-to-nvram' value with some sort of warm  
490 reset that resets the device to some implementation-defined state that is preferably under control of the  
491 system administrator by some means outside the scope of the Printer MIB and this document.



492 The effect of this operation on the currently processing job(s), if any, is not specified by this document.  
493 Note: If this operation does affect the current job(s), it is expected that the operator would issue this  
494 operation on a Printer in the 'idle' state after disabling the Printer with the Disable operation in order to  
495 prevent a job from inadvertently being affected by this operation.

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

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

502 The Reset-Printer Request and Reset-Printer Response have the same attribute groups and attributes as the  
503 Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new "printer-message-  
504 from-operator" operation attribute (see section 2.1), the new "when" operation attribute (see section 2.3),  
505 and with the addition of the following Group 1 operation attributes in the request:

506 "reset-function" (type3 keyword)

507 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute, if  
508 it supports this operation. The value of this attribute indicates the reset function to be performed. If  
509 the client omits this attribute, the Printer assumes the 'reset-to-nvram' value.

510  
511 Standard keyword values are:

512 'power-cycle-reset' - Cold start, i.e., to the state when the device is powered up.

513 'reset-to-nvram' - Warm start.

514 'reset-to-factory-defaults' - reset NVRAM to factory defaults.

515  
516 non-process-run-out" (boolean):

517 The client OPTIONALLY supplies this operation attribute. The IPP object OPTIONALLY supports  
518 this operation attribute, if it is able to perform a non-process-run-out, i.e., remove the last few  
519 printed sheets of a job that is finished printing on a continuous-forms printer. Normally, on such a  
520 printer, the last sheets of a job remain in the printer and are forced out by the next job, thereby  
521 saving time when printing one job after another. This attribute indicates whether or not the printer  
522 is to perform "non-process run-out", i.e., move the last printed sheet to the stacker, before resetting  
523 the Printer.

524  
525 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
526 non-process run-out ('false' behavior). If the Printer does not support this attribute, the Printer is  
527 assumed to perform non-process run-out ('true' behavior). **ISSUE 2: Is the "non-process-run-out"**  
528 **operation attribute really needed at all or can the default behavior for Reset-Printer be defined to be**  
529 **to perform non-process run out (for continuous and cut sheet printers)?**

530 6.1.5 Restart-Printer operation

531 Type of registration: operation

532 Proposed name of this operation: Restart-Printer

533 Object Target: Printer

534 Specification of this operation:

535 This OPTIONAL operation allows a client to restart a Printer that has previously been shutdown in standby  
536 mode (see section 6.1.7). Standby mode is indicated by the Printer's "printer-state" being 'idle' and its  
537 "printer-state-reasons" including the 'standby' value. If the Printer is not in standby mode, the Printer  
538 MUST reject this operation and return the 'client-error-not-possible' status code.

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

543 The Restart-Printer Request and Restart-Printer Response have the same attribute groups and attributes as  
544 the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new "printer-  
545 message-from-operator" operation attribute (see section 2.1) and the following Group 1 operation attribute:

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

547 The client OPTIONALLY supplies this operation attribute. The IPP object OPTIONALLY supports  
548 this operation attribute, if it is able to perform a non-process-run-out, i.e., remove the last few  
549 printed sheets of a job that is finished printing on a continuous-forms printer. Normally, on such a  
550 printer, the last sheets of a job remain in the printer and are forced out by the next job, thereby  
551 saving time when printing one job after another. This attribute indicates whether or not the printer  
552 is to perform "non-process run-out", i.e., move the last printed sheet to the stacker, as part of  
553 restarting the Printer.

554 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
555 non-process run-out ('false' behavior). If the Printer does not support this attribute, the Printer is  
556 assumed to perform non-process run-out ('true' behavior). **ISSUE 3: Is the "non-process-run-out"**  
557 **operation attribute really needed at all or can the default behavior for Restart-Printer be defined to**  
558 **be to perform non-process run out (for continuous and cut sheet printers)?**

559 6.1.6 Space-Printer operation

560 Type of registration: operation

561 Proposed name of this operation: Space-Printer

562 Object Target: Printer

563 Specification of this operation:

564 This OPTIONAL operation allows a client to repeat or skip a specified number of impressions on the target  
565 Printer. The Printer repeats or skips the indicated number of impressions specified by the "back-space" or  
566 "forward-space" operation attribute, respectively. This operation is typically supported in a continuous  
567 forms implementation for synchronizing the web after forms run out or media change.

568 The Printer MUST accept this request in any state and whether or not there is a current job.

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

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

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

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

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

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

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

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

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

588 The client OPTIONALLY supplies this operation attribute. The IPP object OPTIONALLY supports  
589 this operation attribute, if it is able to perform a non-process-run-out, i.e., remove the last few  
590 printed sheets of a job that is finished printing on a continuous-forms printer. Normally, on such a  
591 printer, the last sheets of a job remain in the printer and are forced out by the next job, thereby  
592 saving time when printing one job after another. This attribute indicates whether or not the printer  
593 is to perform "non-process run-out", i.e., move the last printed sheet to the stacker, after spacing the  
594 Printer.

595  
596 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
597 non-process run-out ('false' behavior). If the Printer does not support this attribute, the Printer is  
598 assumed to perform non-process run-out ('true' behavior). **ISSUE 4: Is the "non-process-run-out"**  
599 **operation attribute really needed at all or can the default behavior for Space-Printer be defined to be**  
600 **to perform non-process run out (for continuous and cut sheet printers)?**

#### 601 6.1.7 Shutdown-Printer Operation

602 Type of registration: operation

603 Proposed name of this operation: Shutdown-Printer

604 Object Target: Printer

605 Specification of this operation:

606 This OPTIONAL operation allows a client to shut down a Printer, i.e., stop processing jobs. Whether the  
607 device is powered down or put into standby mode, depends on the value of the "shutdown-function"  
608 operation attribute. If the value is 'power-off', or the "shutdown-function" attribute is omitted, the Printer  
609 adds the 'shutdown' value (see [ipp-mod] section 4.4.11) to its "printer-state-reasons" Printer Description  
610 attribute immediately. If the value is 'standby', the Printer adds the 'standby' value to its "printer-state-  
611 reasons" Printer Description attribute immediately. The execution of the rest of the operation is the same  
612 for either value: The Printer is disabled immediately (see the Disable-Printer operation in section 6.1.2).  
613 The "when" operation attribute specifies how much processing occurs before the shutdown takes place. All  
614 other requests continue to be accepted until the printer is powered down or enters standby mode. In standby  
615 mode, the Printer MUST continue to accept the Restart-Printer and Get-Printer-Attribute requests.

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

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

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

625 The Shutdown-Printer Request and Shutdown-Printer Response have the same attribute groups and  
626 attributes as the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new  
627 "printer-message-from-operator" operation attribute (see section 2.1), the new "when" operation attribute  
628 (see section 2.3), and with the addition of the following Group 1 operation attributes in the request:

629 "non-process-run-out" (boolean)

630 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
631 attribute, if it is able to perform a non-process-run-out, i.e., remove the last few printed sheets of a  
632 job that is finished printing on a continuous-forms printer. Normally, on such a printer, the last  
633 sheets of a job remain in the printer and are forced out by the next job, thereby saving time when  
634 printing one job after another. This attribute indicates whether or not the printer is to perform "non-  
635 process run-out", i.e., move the last printed sheet to the stacker, before shutting down.

636  
637 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
638 non-process run-out ('false' behavior). If the Printer does not support this attribute, the Printer is  
639 assumed to perform non-process run-out ('true' behavior).

640 **ISSUE 5: Is the "non-process-run-out" operation attribute really needed at all or can the default**  
641 **behavior for Shutdown-Printer be defined to be to perform non-process run out (for continuous and**  
642 **cut sheet printers)?**

643 "synchronize" (boolean)

644 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
645 attribute. This attribute indicates whether or not the printer is to synchronize the checkpoint data for  
646 the current job ("when" = 'now') with the pages that have actually printed. If the value of the "when"

647 attribute is not 'now' or the "when" attribute is not supplied, then the "synchronize" attribute has no  
648 meaning and the Printer MUST ignore it. If this attribute is supported, then a value of 'true' implies  
649 that the Printer will be able to resume the job at the point of synchronization when the Printer is  
650 restarted.

651

652 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
653 synchronization ('false' behavior). If the Printer does not support this attribute, the Printer is  
654 assumed to not synchronize ('false' behavior).

655 **ISSUE 6: Do we really need the "synchronize" operation attribute or can synchronization be the**  
656 **default behavior of the Shutdown-Printer operation?**

657 **ISSUE 7: Is the current job automatically restarted when the Printer is restarted? Or does some**  
658 **client have to issue a Restart-Job operation?**

## 659 6.2 Job Operations

660 All Job operations are directed at Job objects. A client MUST always supply some means of identifying the  
661 Job object in order to identify the correct target of the operation. That job identification MAY either be a  
662 single Job URI or a combination of a Printer URI with a Job ID. The IPP object implementation MUST  
663 support both forms of identification for every job.

### 664 6.2.1 Set-Job-Attributes

665 Type of registration: operation

666 Proposed name of this operation: Set-Job-Attributes

667 Object Target: Job

668 Specification of this operation:

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

672 This operation is almost identical to the Set-Printer-Attributes operation (see section 6.1.1). The only  
673 differences are that the Set-Job-Attributes operation is directed at a Job object rather than a Printer object,  
674 there is no "document-format" operation attribute used when setting a Job object, and the validation is the  
675 same as the create job operations, i.e., depends on the "xxx-supported" Printer Description attributes.

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

680 The IPP object MUST accept or reject the request based on the job's current state and transition the job to  
681 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'

682 For Job attributes that are supported, some MUST be settable, some SHOULD be settable, some MAY be  
 683 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 Note: There is no "job-message-from-operator" operation attribute for the Set-Job-Attributes operation.
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

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

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

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

693 6.2.1.1 Set-Job-Attributes Request

694 The following sets of attributes are part of the Set-Job-Attributes Request:

## 695 Group 1: Operation Attributes

## 696 Natural Language and Character Set:

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

699

## 700 Target:

701 Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation  
702 attribute(s) which define the target for this operation as described in [ipp-mod] section 3.1.5.

703

## 704 Requesting User Name:

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

707

## 708 "ipp-attribute-fidelity" (boolean):

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

716

## 717 Group 2: Job Attributes

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

723

## 724 6.2.1.2 Set-Job-Attributes Response

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

## 726 Group 1: Operation Attributes

## 727 Status Message:

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

731

## 732 Natural Language and Character Set:

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

735



## 736 Group 2: Unsupported Attributes

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

738

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

745

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

750

## 751 6.2.2 Reprocess-Job Operation

752 This OPTIONAL operation is a create job operation that allows a client to re-process a copy of a job that  
753 had been retained in the queue after processing completed, was canceled, or was aborted (see [ipp-mod]  
754 section 4.3.7.2). This operation is the same as the Restart-Job operation (see [ipp-mod] section 3.3.7),  
755 except that the Printer creates a new job that is a copy of the target job and the target job is unchanged. The  
756 new job is assigned new values to the "job-uri" and "job-id" attributes and the new job's Job Description  
757 attributes that accumulate job progress, such as "job-impressions-completed", "job-media-sheets-  
758 completed", and "job-k-octets-processed", are initialized to 0 as with any create job operation. The target  
759 job moves to the Job History after a suitable period, independent of whether one or more Reprocess-Job  
760 operations have been performed on it.

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

## 766 6.2.3 Cancel-Current-Job Operation

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

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

775 Warning: On a shared printer, there is a race condition. Between the time that a user issues this operation  
776 and its acceptance, the current job might change to a different job. If the user is authenticated to cancel the  
777 new job, the wrong job is canceled. To prevent this race from canceling the wrong job, the client can  
778 supply the "job-id" operation attribute which is checked against the current job's job-id. If the job identified  
779 by the "job-id" attribute is not the current job on the Printer, the Printer MUST reject this operation and  
780 return the 'client-error-not-possible' status code.

781 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must either be  
782 the job owner of the current job or an operator or administrator of the Printer object (see [ipp-mod] sections  
783 1 and 8.5). Otherwise, the IPP object MUST reject the operation and return: 'client-error-forbidden', 'client-  
784 error-not-authenticated', or 'client-error-not-authorized' as appropriate.

785 The Cancel-Current-Job Request and Cancel-Current-Job Response have the same attribute groups and  
786 attributes as the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new  
787 "job-message-from-operator" operation attribute (see section 2.2), with the addition of the following Group  
788 1 Operation attributes in the request:

789 "job-id" (integer(1:MAX)):

790 The client OPTIONALLY supplies this Operation attribute in order to verify that the identified job  
791 is still the current job on the target Printer object. The IPP object MUST support this operation  
792 attribute, if it supports this operation.

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

794 The client OPTIONALLY supplies this Operation attribute. The IPP object OPTIONALLY  
795 supports this operation attribute, if it is able to perform a non-process-run-out, i.e., remove the last  
796 few printed sheets of a job that is finished printing on a continuous-forms printer. Normally, on  
797 such a printer, the last sheets of a job remain in the printer and are forced out by the next job,  
798 thereby saving time when printing one job after another. However, when canceling the current job it  
799 is desirable to move the end of the canceled job to the stacker. This attribute indicates whether or  
800 not the printer is to perform "non-process run-out", i.e., move the last printed sheet to the stacker,  
801 after canceling the current job.

802  
803 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
804 non-process run-out ('false' behavior). If the Printer does not support this attribute, the Printer is  
805 assumed to perform non-process run-out ('true' behavior).

806 **ISSUE 8: Why isn't non-process-run-out automatic on a continuous form printer? When would an**  
807 **operator want to cancel the job and NOT run out the last sheets.? It would be simpler to require**  
808 **process-run-out when canceling the current job (for continuous and cut sheet printers).**

809

#### 810 6.2.4 Pause-Job operation

811 This OPTIONAL operation allows a client to stop the target job and allow other jobs to be processed  
812 instead. The Printer moves the target job to the 'pending-held' state and sets the 'job-paused' value in the

813 job's "job-state-reasons" attribute. **ISSUE 9: Or should the job's state be 'processing-stopped' after a Pause-**  
814 **Job or Pause-Current-Job operation in order to indicate that it has processed some with the 'job-paused'**  
815 **value added to the job's "job-state-reasons" attribute? Then the 'pending-held' job state is not partitioned**  
816 **into two parts depending on whether the Hold-Job or Pause-Job operation was performed.**

817 If the target job is not in the 'processing' or 'processing-stopped' states, the Printer rejects the request and  
818 returns the 'client-error-not-possible' status code. Otherwise, the Printer stops the target job and processes  
819 other jobs.

820 The Printer MUST reject a Release-Job request (and return the 'client-error-not-possible') for a job that has  
821 been paused, i.e., for a job in the 'pending-held' state, with the 'job-paused' value in its "job-state-reasons"  
822 attribute.

823 If the Pause-Job operation is supported, then the Pause-Current-Job and Resume-Job operations MUST be  
824 supported, and vice-versa.

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

829 The Pause-Job Request and Pause-Job Response have the same attribute groups and attributes as the  
830 Cancel-Job operation (see [ipp-mod] section 3.3.3.1), including the new "job-message-from-operator"  
831 operation attribute (see section 2.2), the new "when" operation attribute (see section 2.3), with the addition  
832 of the following Group 1 Operation attribute in the request:

833 "non-process-run-out" (boolean)

834 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
835 attribute, if it is able to perform a non-process-run-out, i.e., remove the last few printed sheets of a  
836 job that is finished printing on a continuous-forms printer. Normally, on such a printer, the last  
837 sheets of a job remain in the printer and are forced out by the next job, thereby saving time when  
838 printing one job after another. This attribute indicates whether or not the printer is to perform "non-  
839 process run-out", i.e., move the last printed sheet to the stacker, as part of pausing the job.

840 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
841 non-process run-out ('false' behavior). If the Printer does not support this attribute, the Printer is  
842 assumed to perform non-process run-out ('true' behavior).

843 **ISSUE 10: Is the "non-process-run-out" operation attribute really needed at all or can the default**  
844 **behavior for Pause-Job be defined to be to perform non-process run out (for continuous and cut**  
845 **sheet printers)?**

846  
847 "synchronize" (boolean)

848 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
849 attribute. This attribute indicates whether or not the printer is to synchronize the checkpoint data for  
850 the current job being paused with the pages that have actually printed. If this attribute is supported,  
851

852 then a value of 'true' implies that the Printer will be able to resume the job at the point of  
853 synchronization when the job is resumed.

854

855 If the client does not supply this attribute and the attribute is supported, the Printer does not perform  
856 synchronization ('false' behavior). If the Printer does not support this attribute, the Printer is  
857 assumed to not synchronize ('false' behavior).

858 **ISSUE 11: Do we really need the "synchronize" operation attribute or can synchronization be the**  
859 **default behavior of the Pause-Job operation?**

## 860 6.2.5 Pause-Current-Job operation

861 This OPTIONAL operation allows a client to stop the current job on the target Printer and allow other jobs  
862 to be processed instead. The Printer moves the current job to the 'pending-held' state and sets the 'job-  
863 paused' value in the job's "job-state-reasons" attribute. **ISSUE 12: Or should the job's state be 'processing-**  
864 **stopped' after a Pause-Job or Pause-Current-Job operation in order to indicate that it has processed some?**  
865 **Then the 'pending-held' job state is not partitioned into two parts depending on whether the Hold-Job or**  
866 **Pause-Current-Job operation was performed.**

867 If there are no jobs in the 'processing' or 'processing-stopped' states, the Printer rejects the request and  
868 returns the 'client-error-not-possible' status code. Otherwise, the Printer stops the current job and processes  
869 other jobs.

870 **Warning:** On a shared printer, there is a race condition. Between the time that a user issues this operation  
871 and its acceptance, the current job might change to a different job. If the user is authenticated to pause the  
872 new job, the wrong job is paused. To prevent this race from pausing the wrong job, the client can supply  
873 the "job-id" operation attribute which is checked against the current job's job-id. If the job identified by the  
874 "job-id" attribute is not the current job on the Printer, the Printer MUST reject this operation and return the  
875 'client-error-not-possible' status code.

876 If the Pause-Current-Job operation is supported, then the Pause-Job and Resume-Job operations MUST be  
877 supported, and vice-versa.

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

882 The Pause-Current-Job Request and Pause-Current-Job Response have the same attribute groups and  
883 attributes as the Pause-Job operation (see 6.2.4), including the new "job-message-from-operator" operation  
884 attribute (see section 2.2), with the addition of the following Group 1 Operation attribute in the request, but  
885 not including the new "when" operation attribute (see section 2.3):

886 "job-id" (integer(1:MAX)):

887 The client OPTIONALLY supplies this Operation attribute in order to verify that the identified job  
888 is still the current job on the target Printer object. The IPP object MUST support this operation  
889 attribute, if it supports this operation.

## 890 6.2.6 Resume-Job operation

891 This OPTIONAL operation allows a client to stop the target job and allow other jobs to be processed  
892 instead. The Printer moves the target job to the 'pending' state and removes the 'job-paused' value from the  
893 job's "job-state-reasons" attribute. **ISSUE 13: Or should the job's state be 'processing-stopped' after a  
894 Pause-Job or Pause-Current-Job operation in order to indicate that it has processed some? Then the  
895 'pending-held' job state is not partitioned into two parts depending on whether the Hold-Job or Pause-Job  
896 operation was performed.**

897 If the target job is not in the 'pending-held' state with the 'job-paused' value in the job's "job-state-reasons"  
898 attribute, the Printer rejects the request and returns the 'client-error-not-possible' status code.

899 If the Resume-Job operation is supported, then the Pause-Job and Pause-Current-Job operations MUST be  
900 supported, and vice-versa.

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

905 The Resume-Job Request and Resume-Job Response have the same attribute groups and attributes as the  
906 Cancel-Job operation (see [ipp-mod] section 3.3.3), including the new "job-message-from-operator"  
907 operation attribute (see section 2.2).

## 908 6.2.7 Promote-Job operation

909 This OPTIONAL operation allows a client to make the pending target job be processed next after the  
910 current job completes.

911 If the target job is in the 'pending' state, this operation does not change the job's state, but the Printer adds  
912 the 'process-next' value to the job's "job-state-reasons" attribute. If the target job is not in the 'pending'  
913 state, the Printer rejects the request and returns the 'client-error-not-possible' status code. The Printer  
914 returns the target job immediately after the current job(s) in a Get-Jobs response (see [ipp-mod] section  
915 3.2.6) for the 'not-completed' jobs.

916 When the current job completes, is canceled, paused, or aborted, the target of this operation is processed  
917 next, at which time the Printer removes the 'process-next' value from the job's "job-state-reasons" attribute.

918 If a client issues this request (again) before the target of the operation of the original request started  
919 processing, the target of this new request replaces the previous job that was to be processed next. The  
920 Printer removes the 'process-next' from the previous job and adds the value to the target of the subsequent  
921 request. In other words, only one job at a time has the property to be the next job and no more than one job  
922 has the 'process-next' value in its "job-state-reasons" attribute at the same time.

923 If a client issues a Hold-Job operation with the target being the job that is to be processed next, the Printer  
924 removes the 'process-next' value from the target job's "job-state-reasons" attribute and moves it to the 'held'  
925 state.

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

930 The Promote-Job Request and Promote-Job Response have the same attribute groups and attributes as the  
931 Cancel-Job operation (see [ipp-mod] section 3.3.3), including the new "job-message-from-operator"  
932 operation attribute (see section 2.2).

### 933 6.2.8 Space-Current-Job operation

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

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

940 *Warning:* On a shared printer, there is a race condition. Between the time that a user issues this operation  
941 and its acceptance, the current job might change to a different job. If the user is authenticated to space the  
942 new job, the wrong job is spaced. To prevent this race from spacing the wrong job, the client can supply  
943 the "job-id" operation attribute which is checked against the current job's job-id. If the job identified by the  
944 "job-id" attribute is not the current job on the Printer, the Printer MUST reject this operation and return the  
945 'client-error-not-possible' status code.

946 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must either be  
947 the job owner of the current job or an operator or administrator of the Printer object (see [ipp-mod] sections  
948 1 and 8.5). Otherwise, the IPP object MUST reject the operation and return: 'client-error-forbidden', 'client-  
949 error-not-authenticated', or 'client-error-not-authorized' as appropriate.

950 The Space-Current-Job Request and Space-Current-Job Response have the same attribute groups and  
951 attributes as the Space-Printer operation (see section 6.1.6), including the new "job-message-from-operator"  
952 operation attribute (see section 2.2), with the addition of the following Group 1 Operation attribute in the  
953 request:

954 "job-id" (integer(1:MAX)):

955 The client OPTIONALLY supplies this Operation attribute in order to verify that the identified job  
956 is still the current job on the target Printer object. The IPP object MUST support this operation  
957 attribute, if it supports this operation.

958