

1 INTERNET-DRAFT - 14 ISSUES are numbered and highlighted like this  
2 <draft-ietf-ipp-ops-set2-01.txt>

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## 3 4 5 6 7 8 Internet Printing Protocol/1.1: Set2 Operations

### 9 10 11 Status of this Memo

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### 21 Abstract

22 This document specifies 14 additional OPTIONAL operations for use with the Internet Printing  
23 Protocol/1.0 (IPP) [RFC2565, RFC2566] and IPP/1.1 [ipp-mod, ipp-pro]. These operations are 7 Printer  
24 object operations that operators/administrators may perform on a Printer object:

25 Set-Printer-Attributes  
26 Enable-Printer  
27 Disable-Printer  
28 Restart-Printer  
29 Shutdown-Printer

30 and 7 Job object operations that end-users may perform on their jobs and operators/administrators may  
31 perform on any job, depending on circumstances:

32 Set-Job-Attributes  
33 Reprocess-Job  
34 Cancel-Current-Job (though the target is the Printer object)  
35 Pause-Current-Job (though the target is the Printer object)  
36 Resume-Job  
37 Promote-Job

38 The Interpreter object is added for those implementations that make a distinction on the values of some  
39 Printer attributes depending on the document-format, such as "resolution-supported".

40 In addition, two operation attributes are defined: "printer-message-from-operator" and "job-message-from-  
41 operator" are included to set the corresponding Printer and Job Description attributes with the same names.  
42 And the "when" operation attribute is added to the IPP/1.1 Pause-Printer operation as well as some of the  
43 Set2 Printer operations.

44 New Printer Description attributes are added, along with additional values for the "printer-state-reasons"  
45 and "job-state-reasons" attributes.

46 New status codes: 'client-error-attributes-not-settable' and 'server-error-printer-is-in-standby-mode' are  
47 added.

48 Finally, the 'not-settable' out-of-band value is added for use with the Set-Printer-Attributes and Set-Job-  
49 Attributes operations.

50 The scope of IPP, is characterized in RFC2526 "Design Goals for an Internet Printing Protocol". It is not  
51 the intent of this document to revise or clarify this scope or conjecture as to the degree of industry adoption  
52 or trends related to IPP within printing systems. It is the intent of this document to extend the original set  
53 of operations - in a similar fashion to the Set1 extensions which referred to IPP/1.0 and were later  
54 incorporated into IPP/1.1.

55 This document is intended for registration following the registration procedures of IPP/1.0 [RFC2566] and  
56 IPP/1.1 [ipp-mod]. This version includes the comments discussed at the IPP telecon, on 6/23/1999,  
57 6/30/1999, at the IETF IPP WG meeting, 7/7/99-7/8/99, in Copenhagen, and the IPP telecon, 7/17/1999, the  
58 August, 1999 IPP meeting in Alaska and subsequent phone conferences and discussions. Specifically, the  
59 9/16 update refers to this set of extensions simply as "Set2" rather than using the term "Administrative"  
60 which was misleading, controversial and incorrect as an overall description. Also, two new attributes have  
61 been proposed to clarify the intent of each operation in terms of its target, the Printer vs. the Print Job.  
62 **Unresolved ISSUES are highlighted like this in the .doc and .pdf files.**

63 The full set of IPP documents includes:

- 64 Design Goals for an Internet Printing Protocol [RFC2567]
- 65 Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]
- 66 Internet Printing Protocol/1.1: Model and Semantics (this document)
- 67 Internet Printing Protocol/1.1: Encoding and Transport [IPP-PRO]
- 68 Internet Printing Protocol/1.1: Implementer's Guide [IPP-IIG]
- 69 Mapping between LPD and IPP Protocols [RFC2569]

70

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

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

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

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

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

92

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## 147 1. Introduction

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

## 153 2. New objects

154 This section defines the new Interpreter object and the use of the Printer object to represent fan-out.

## 155 2.1 Interpreter object

156 The Interpreter object models the document format interpreters that are contained in the Printer object. The  
157 purpose of the Interpreter object is to model those Printer attributes whose value depends on which  
158 interpreter is being used to process the document. Depending on implementation, the Printer object  
159 attributes whose values ("xxx-supported" and "xxx-default") depend on the interpreter, i.e., on the  
160 "document-format" of the document being processed, are considered to be Interpreter object attributes  
161 instead. A Get-Printer-Attributes operation returns Printer and Interpreter attributes as specified in the  
162 "requested-attributes" operation attribute supplied by the client. Depending on the value of the "document-  
163 format" attribute supplied by the client in the Get-Printer-Attributes request (or the "document-format-  
164 default", if the client omits the "document-format" attribute), selects the corresponding Interpreter object.

165 If an implementation does not make a distinction on the values of Printer attributes by document format,  
166 say, for purposes of job validation (see [ipp-mod] Get-Printer-Attributes), there is no need to implement or  
167 support the Interpreter object. The Interpreter object is introduced to provide a means to model an  
168 implementation in which some attributes do depend on the document format. Those attributes are then sub-  
169 classed to be Interpreter object attributes.

170 Note: the addition of the Interpreter object is completely compatible with IPP/1.0 and IPP/1.1 (see the  
171 description of the "document-format" operation attribute in [ipp-mod] section 3.2.5.1 Get-Printer-Attributes  
172 request). The protocol and semantics are the same whether or not the Interpreter object is used to  
173 distinguish attributes that depend on the "document-format". Consequently, there is no "interpreters-  
174 supported" Printer Description attribute. In order to determine which Interpreter objects there MAY be, the  
175 client can request the values of the Printer's "document-format-supported" attribute.

176 Note: The Interpreter object is really a sub-class of the Printer object, rather than being a full fledged object  
177 in the sense that the Job and Printer objects are. There are no operations defined solely for the Interpreter  
178 object. The Get-Printer-Attributes and Set-Printer-Attributes operations operate on the Interpreter object if  
179 the implementation has the concept of an Interpreter object. However, if the IPP Printer implementation  
180 does not contain Interpreter objects, the same Interpreter object attributes are considered Printer object  
181 attributes, instead.

## 182 2.2 Use of the Printer object to represent fan-out

183 The IPP/1.1 Model and Semantics introduces the semantic concept of an IPP Printer object that represents  
184 more than one output device (see [ipp-mod] section 2.1). However, there was no way to represent the  
185 individual states of the devices or to perform operations on selected devices. This specification generalizes  
186 the semantics of the Printer object to represent such "subordinate" fan-out devices as IPP Printer objects.  
187 Thus a "parent" Printer object MAY support two or more subordinate Printer objects in order to represent  
188 fan-out. Such a parent Printer object MUST support the "subordinate-printers-supported" (1setOf uri)  
189 Printer Description attribute.

190 A conforming subordinate Printer object NEED NOT support all of the REQUIRED operations. For  
191 example a subordinate Printer NEED NOT support a Print-Job operation, unless it is a networked printer  
192 that supports the IPP Protocol. In such a case, the subordinate Printer MAY be configured so that its access  
193 control list only permits the parent Printer to submit jobs to it. A subordinate Printer MAY, in turn, have  
194 subordinate Printers.

195 **ISSUE 01 - What sub-set of the REQUIRED IPP/1.1 operations MUST a subordinate Printer object**  
196 **support? Get-Printer-Attributes? Any others?**

197 **ISSUE 02 - Are there any IPP Printer or Job operations that a subordinate Printer MUST NOT support?**

198 **ISSUE 03 - Are all the REQUIRED attributes of a Printer object REQUIRED for a subordinate Printer**  
199 **object?**

200 The degenerate case of a Printer having only a single subordinate Printer is not allowed.

201 Each subordinate Printer object has a URI which is used as the target of each operation on the subordinate  
202 Printer. The means for configuring URIs for subordinate Printer objects is implementation-dependent as  
203 are all URIs. However, there are two distinct approaches:

204 a. When the implementation wants to make sure that no operation on a subordinate Printer object as  
205 a target "sneaks by" the parent Printer object (or the subordinate Printer is fronting for a device that  
206 is not networked), the host part of the URI specifies the host of the parent Printer. Then the parent  
207 Printer object can easily reflect the state of the subordinate Printer objects in the parent's Printer  
208 object state and state reasons as the operation passes "through" the parent Printer object.

209 b. When the subordinate Printer is networked and the implementation allows operations to go  
210 directly to the subordinate Printer (with proper access control) without knowledge of the parent  
211 Printer object, the host part of the URI is different than the host part of the parent Printer object. In  
212 such a case, the parent Printer object MUST keep its "printer-state" and "printer-state-reasons" up to  
213 date, either by polling the subordinate Printer object or by subscribing to events with the subordinate  
214 Printer object (see [ipp-not-spec] for means to do this when the subordinate Printer object supports  
215 IPP notification).

## 216 2.3 Device object

217 In order to control the physical device, the Device object is introduced. Its semantics are defined in [ipp-  
218 set3]. The Device object has attributes that represent physical characteristics of the device, such as input  
219 trays, output bins, and finishing equipment. Thus the Printer object remains as the representative of a  
220 logical entity or service, while the Device object represents a physical entity. The operations in this Set2  
221 document operate only on Printer objects, not on Device objects. However, some of the Set2 Printer  
222 operations have analogous Device operations. For example, the Shutdown-Printer and Shutdown-Device  
223 operations are defined in Set2 and Set3, respectively.

## 224 3. New Operation attributes

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

## 227 3.1 New operation attribute: "printer-message-from-operator" (text(127))

228 Type of registration: attribute

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

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

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

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

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

234

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

236

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

238 The client OPTIONALLY supplies this attribute. The Printer object SHOULD supports this  
239 operation attribute if it supports the corresponding Printer Description attribute. The value of this  
240 attribute is a message from the operator about the Printer object on which the operator is performing  
241 the operation. If supported, the Printer copies the value to the Printer's "printer-message-from-  
242 operator" Printer Description attribute (see [ipp-mod] section 4.4.25), automatically sets the value of  
243 the Printer's "printer-message-time" with the current value of the Printer's "printer-up-time"  
244 attribute, the value of the "printer-message-date-time" with the current value of the Printer's  
245 "printer-current-date-time" attribute, and the value of the Printer's "printer-message-operation" with the  
246 operation-id value of this operation (see [ipp-mod] section 4.4.15).

247

248 If the client omits this attribute, the Printer does not change the value of its "printer-message-from-  
249 operator", "printer-message-time", "printer-message-date-time", and "printer-message-operation"  
250 Printer Description attributes.

251

252 If the client supplies this attribute with a zero-length text value or with a value consisting solely of  
253 white space, the Printer copies that value as any other value to the Printer's "printer-message-from-  
254 operator" and sets the "printer-message-time", "printer-message-date-time", and "printer-message-

255 operation" attributes. Supplying such a value is the way that the operator indicates that there is no  
256 longer a printer message from the operator (rather than using the "out-of-band" 'no-value' value).  
257

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

- 259 Pause-Printer - see [ipp-mod] section 3.2.7
- 260 Resume-Printer - see [ipp-mod] section 3.2.8
- 261 Purge-Jobs - see [ipp-mod] section 3.2.9
- 262 Disable-Printer - see section 8.1.2
- 263 Enable-Printer - see section 8.1.3
- 264 Restart-Printer - see section 8.1.4
- 265 Shutdown-Printer - see section 8.1.5
- 266

267 The "printer-message-from-operator" operation attribute MUST NOT be supported as an operation attribute  
268 for the Set-Printer-Attributes operation. If the operator wants to set the Printer's "printer-message-from-  
269 operator" Printer Description attribute when issuing the Set-Printer-Attributes operation, the client supplies  
270 the "printer-message-from-operator" with its new value as one of the Printer Description attributes in Group  
271 2 in the request. The Printer also updates the Printer's "printer-message-date-time" and "printer-message-  
272 operation" Printer Description attributes. If the client does not explicitly supply the "printer-message-from-  
273 operator" with its new value, the Printer leaves the value of the Printer's "printer-message-from-operator"  
274 Printer Description attribute unchanged.

275 3.2 New operation attribute: "job-message-from-operator" (text(127))

276 Type of registration: attribute

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

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

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

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

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

282

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

284

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

286 The client OPTIONALLY supplies this attribute. The Printer object SHOULD supports this  
287 operation attribute if it supports the corresponding Job Description attribute. The value of this  
288 attribute is a message from the operator about the Job object on which the operator has just  
289 performed an operation. If supported, the Printer copies the value to the Job's "job-message-from-  
290 operator" Job Description attribute (see [ipp-mod] section 4.3.16).

291

292 If the client omits this attribute, the Printer does not change the value of its "printer-message-from-  
293 operator" Job Description attribute.

294

295 If the client supplies this attribute with a zero-length text value or with a value consisting solely of

296 white space, the Printer copies that value as any other value to the job's "job-message-from-  
297 operator". Supplying such a value is the way that the operator indicates that there is no longer a job  
298 message from the operator (rather than using the "out-of-band" 'no-value' value).  
299

300 Note: There are no corresponding 'job-message-time', "job-message-date-time", and "job-message-  
301 operation" Job Description attributes, since the usual lifetime of a job is limited.  
302

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

304 Cancel-Job - see [ipp-mod] section 3.2.4  
305 Hold-Job - see [ipp-mod] section 3.3.5  
306 Release-Job - see [ipp-mod] section 3.3.6  
307 Restart-Job - see [ipp-mod] section 3.3.7  
308 Reprocess-Job - see section 8.2.2  
309 Cancel-Current-Job - see section 8.2.3  
310 Pause-Current-Job - see section 8.2.4  
311 Resume-Job - see section 8.2.5  
312 Promote-Job - see section 8.2.6  
313

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

320 3.3 New operation attribute for Get-Printer-Attributes: "factory-settings" (boolean)

321 Type of registration: attribute  
322 Proposed keyword name of this attribute: "factory-settings"  
323 Types of attribute (Operation, Job Template, Job Description, Printer Description): Operation  
324 Operations to be used with if the attribute is an operation attribute: Get-Printer-Attributes  
325 Object (Job, Printer, etc. if bound to an object): N/A  
326 Attribute syntax(es) (include 1setOf and range as in Section 4.2): boolean  
327

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

329 "factory-settings" (boolean)

330 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
331 attribute, if it supports the Set-Printer-Attributes operation. If the client omits this attribute or  
332 supplies the 'false' value, the Printer returns the current values of the requested attributes that are  
333 settable, i.e., the values that have been set by previous Set-Printer-Attributes. If the client supplies  
334 the 'true' value, the Printer returns the factory settings, i.e., the inherent values supported by the  
335 implementation as shipped from the manufacturer or established at install time. This operation  
336 attribute allows an operator to determine which values are supported in an implementation after

337 having modified a settable attribute. Attributes that are not settable are not affected by this  
338 operation attribute, so that the Printer returns the same values for non-settable attribute when either  
339 the 'true' or 'false' value has been supplied. If this operation attribute is supported, both 'true' and  
340 'false' values MUST be supported.

#### 341 3.4 New operation attribute for Pause-Printer: "when" (type2 keyword)

342 Type of registration: attribute

343 Proposed keyword name of this attribute: "when"

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

345 Operations to be used with if the attribute is an operation attribute: Pause-Printer, Shutdown-Printer, and  
346 Pause-Current-Job

347 Object (Job, Printer, etc. if bound to an object): N/A

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

349

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

351 "when" (type2 keyword)

352 The client **OPTIONALLY** supplies this attribute. The Printer object **OPTIONALLY** supports this  
353 attribute, if it supports this operation. The value of this attribute indicates when to pause the printer.  
354 If the client omits this attribute, the Printer assumes the 'after-current-job' value. The 'after-current-  
355 job' value is **REQUIRED** to be supported if the "when" attribute is supported; the remaining values  
356 are **OPTIONAL**.

357 Note: There is no way to query to see which values of the "when" attribute are supported for this or  
358 any other operation. Since this operation is intended for Operators, rather than End-Users, it did not  
359 seem necessary to provide the means to query the supported values.

360

361 Standard keyword values are:

362 'now' - pause the Printer immediately, while the current job is processing. See [ipp-mod]  
363 section 3.2.7) for the effect on the Printer's "printer-state" and "printer-state-reasons"  
364 attributes. Jobs in the 'held' and 'pending' state remain in those states.

365 'after-current-copy' - pause the Printer after the current job finishes printing its current copy.  
366 Jobs in the 'held' and 'pending' state remain in those states.

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

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

371 Note: The "when" operation attribute is also defined for use with the Shutdown-Printer (see section 8.1.5)  
372 and the Pause-Current-Job (see section 8.2.4) operations, but with a subset of these values.

#### 373 3.5 Summary of the operation attributes for the Printer operations

374 The following table shows the operation attributes for the Printer operations that a client **MAY** supply in a  
375 request. Operation parameters and attributes that a client **MUST** supply are not shown. Also "requesting-  
376 user-name" is not shown, though it is **RECOMMENDED** that a client supply it in every request.

377 Legend:

378

R - REQUIRED for a Printer to support

379

O - OPTIONAL for a Printer to support; the Printer ignores the attribute if not supported

Operation Attribute	Pause-Printer	Resume-Printer	Purge-Jobs	Get-Printer-Attributes	Set-Printer-Attributes	Enable-Print	Disable-Printer		Restart-Printer		Shut down-Printer
document-format				R	R						
factory-settings				O							
printer-message-from-operator	O	O	O			O	O		O		O
job-type						O	O				
when	O										O
reset-function											
synchronize											O
shutdown-function											R

380 3.6 Summary of the operation attributes for the Job operations

381 The following table shows the operation attributes for the Job operations that a client MAY supply in a  
 382 request. Operation attributes that specify the Printer or Job object as the target are shown in the first two  
 383 rows, respectively. Other operation attributes and parameters that a client MUST supply are not shown.  
 384 Also "requesting-user-name" is not shown, though it is RECOMMENDED that a client supply it in every  
 385 request.

386 Legend:

387 R - REQUIRED for a Printer to support

388 O - OPTIONAL for a Printer to support; the Printer ignores the attribute if not supported

Operation Attribute	Cancel-Job	Cancel-Current-Job	Hold-Job	Release-Job		Pause-Current-Job	Resume-Job	Get-Job-Attributes	Set-Job-Attributes	Restart-Job	Reprocess-Job	Promote-Job
printer-uri		R				R						
printer-uri/job-id or job-uri	R		R	R			R	R	R	R	R	R
job-id		R				R						
requested-attributes								R				
back-space												
forward-space												
synchronize						O						
when						O						
job-message-from-operator	O	O	O	O		O	O			O	O	O
message [to-operator]	O		O	O		O	O			O	O	O
job-hold-until			O*	O*							O**	

389 \* The Printer MUST support the "job-hold-until" operation attribute if it supports the "job-hold-until" Job  
390 Template attribute.

391 \*\* The Printer MUST support the "job-hold-until" operation attribute if it supports the Set-Job-Attributes  
392 operation, so that the client can hold the job with the Reprocess-Job operation and the modify the job before  
393 releasing it to be processed.

#### 394 4. New Printer Description Attributes

395 The following new Printer Description attributes are needed to support the new operations defined in this  
396 document.

##### 397 4.1 printer-settable-attributes (1setOf type2 keyword)

398 Type of registration: attribute

399 Proposed keyword name of this attribute: printer-settable-attributes

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

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

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

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

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

405 If this is a Printer attribute, MAY the value returned depend on "document-format" (See Section 6.2): Yes

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

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

##### 409 4.1.1 printer-settable-attributes (1setOf type2 keyword)

410 This READ-ONLY Printer attribute identifies the Printer object attributes that are settable in this  
411 implementation, i.e., that are settable using the Set-Printer-Attributes operations. This attribute MUST be  
412 supported if the Set-Printer-Attributes operations is supported. The Printer MUST reject attempts to set any  
413 Printer attributes that are not in this list, returning the 'client-error-attributes-not-settable' status code (see  
414 section 6.1). The value of this attribute MAY depend on the value of the "document-format" operation  
415 attribute supplied in the Get-Printer-Attributes operation (see [ipp-mod] section 3.2.5.1).

##### 416 4.2 job-settable-attributes (1setOf type2 keyword)

417 Type of registration: attribute

418 Proposed keyword name of this attribute: job-settable-attributes

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

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

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

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

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

424 If this is a Printer attribute, MAY the value returned depend on "document-format" (See Section 6.2): Yes

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

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

428 4.4.? job-settable-attributes (1setOf type2 keyword)

429 This READ-ONLY Printer attribute identifies the Job object attributes that are settable in this  
430 implementation, i.e., that are settable using the Set-Job-Attributes operations. This attribute MUST be  
431 supported if the Set-Job-Attributes operations is supported. The Printer MUST reject attempts to set any  
432 Job attributes that are not in this list, returning the 'client-error-attributes-not-settable' status code (see  
433 section 6.1).

434 4.3 printer-controls-other-protocols (boolean)

435 Type of registration: attribute

436 Proposed keyword name of this attribute: printer-controls-other-protocols

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

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

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

440 Attribute syntax(es) (include 1setOf and range as in Section 4.2): boolean

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

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

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

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

446 4.4.? printer-controls-other-protocols (boolean)

447 This Printer attribute indicates whether all IPP printer and job operations, such as Disable-Printer, Pause-  
448 Printer, Cancel-Job, etc., affect non-IPP protocols that may be supported. It is RECOMMENDED that IPP  
449 control other non-IPP protocols. However, this attribute permits an implementation to indicate explicitly  
450 whether it does affect other protocols or not.

451 A 'false' value indicates that IPP operations only affect jobs submitted by the IPP Protocol. For example, a  
452 'true' value indicates that a Disable-Printer operation prevents all protocols from submitting jobs, not just  
453 the IPP protocol. A 'true' value indicates that the Pause-Printer operation would pause the current job, no  
454 matter what job submission protocol had submitted it. A 'true' value indicates that the Cancel-Job operation  
455 will cancel the specified job even if it was submitted using a different job submission protocol, such as  
456 LPR.

457 As with any Printer Description attribute that this specification does not list as READ-ONLY, an  
458 implementation MAY allow a client to change the value of this attribute using Set-Printer-Attributes,  
459 thereby changing the way that the IPP operations affect other non-IPP protocols. An implementation MAY  
460 also support other means to change the value of this attribute, such as via the console or at installation time.

## 461 4.4 printer-message-time (integer(MIN:MAX))

462 Type of registration: attribute

463 Proposed keyword name of this attribute: printer-message-time

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

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

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

467 Attribute syntax(es) (include 1setOf and range as in Section 4.2): integer(MIN:MAX)

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

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

470 If this is a Job Template attribute, how does its specification depend on the value of the "multiple-

471 document-handling" attribute: N/A

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

## 473 4.4.? printer-message-time (integer(MIN:MAX))

474 This READ-ONLY Printer Description attribute contains the time that the Printer's "printer-message-from-  
475 operator" was changed by the operator using any operation where the client supplied the "printer-message-  
476 from-operator" operation attribute (see section 3.1) or was explicitly set using the Set-Printer-Attributes  
477 operation (see section 8.1.1). This attribute allows the users to know when the "printer-message-from-  
478 operator" attribute was last set.

479 The Printer sets the value of this attribute by copying the value of the Printer's "printer-up-time" attribute  
480 (see [ipp-mod] section 4.3.14). If the Printer resets its "printer-up-time" attribute to 1 on power-up, then it  
481 MUST change the value of the "printer-message-time" to 0 or a negative number as specified in [ipp-mod]  
482 section 4.3.14.

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

## 485 4.5 printer-message-date-time (dateTime)

486 Type of registration: attribute

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

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

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

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

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

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

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

494 If this is a Job Template attribute, how does its specification depend on the value of the "multiple-

495 document-handling" attribute: N/A

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

## 497 4.4.? printer-message-date-time (dateTime)

498 This READ-ONLY Printer Description attribute contains the date and time that the Printer's "printer-  
499 message-from-operator" was changed by the operator using any operation where the client supplied the  
500 "printer-message-from-operator" operation attribute (see section 3.1) or was explicitly set using the Set-  
501 Printer-Attributes operation (see section 8.1.1). This attribute allows the users to know when the "printer-  
502 message-from-operator" attribute was last set. This attribute MUST be supported if the Printer supports  
503 both the "printer-message-from-operator" and the "printer-current-date-time" attributes.

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

#### 506 4.6 printer-message-operation (type2 keyword)

507 Type of registration: attribute

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

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

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

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

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

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

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

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

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

#### 518 4.4.? printer-message-operation (type2 enum)

519 This READ-ONLY Printer Description attribute contains the operation that was used to changed the  
520 Printer's "printer-message-from-operator" by the operator using any operation where the client supplied the  
521 "printer-message-from-operator" operation attribute (see section 3.1) or explicitly set using the Set-Printer-  
522 Attributes operation (see section 8.1.1). This attribute allows the users to know which operation was used  
523 to change the "printer-message-from-operator" attribute when it was last set.

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

#### 525 4.7 subordinate-printers-supported (1setOf uri)

526 This Printer attribute is REQUIRED if an implementation supports subordinate Printers (see section 2.2)  
527 and contains the URIs of the subordinate Printer objects associated with this Printer object. In order to  
528 support subordinate Printer objects, there MUST be at least two subordinate Printer objects.

529 The precise format of the subordinate Printer URIs is implementation dependent (see section 2.2).

530 If the Printer object does not have an associated Device object (see section 2.3), the value of the subordinate  
531 Printer object's "printer-name" MAY be used to populate the Job object's "output-device-assigned"  
532 attribute (see [ipp-mod] section 4.3.13). The "output-device-assigned" Job attribute identifies the output

533 device to which the Printer object has assigned a job, for example, when a single Printer object is  
534 supporting fan-out.

## 535 5. Additional values for "printer-state-reasons" and "job-state-reasons" attributes

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

### 538 5.1 Value for "printer-state-reasons": 'standby'

539 Type of registration: type2 keyword attribute value

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

541 Proposed keyword name of this keyword value: standby

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

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

### 546 5.2 Value for "job-state-reasons": 'job-paused'

547 Type of registration: type2 keyword attribute value

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

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

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

551 'job-paused': The job has been paused while processing using the Pause-Current-Job operations and  
552 other jobs can be processed on the Printer. The Job can be resumed using the Resume-Job operation  
553 which removes this value.  
554

## 555 6. New status codes

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

### 557 6.1 New status code: 'client-error-attributes-not-settable'

558 Type of registration: status code

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

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

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

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

## 564 13.1.4.20 client-error-attributes-not-settable (0x0413)

565 In a Set-Printer-Attributes or Set-Job-Attributes request, if the Printer object does not support one or more  
 566 attributes as settable, the Printer object MUST return this status code. The Printer object MUST also return  
 567 in the Unsupported Attributes Group all the attributes and/or values supplied by the client that are not  
 568 settable. See [ipp-mod] section 3.1.7. For example, if the request indicates 'job-state', all implementations  
 569 MUST reject the request. As another example, if the request indicates an attribute that is supported, but not  
 570 settable by this implementation, such as, say, "printer-name", the implementation rejects the request.

## 571 6.2 New status code: 'server-error-printer-is-in-standby-mode'

572 Type of registration: status code

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

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

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

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

## 578 13.1.5.8 server-error-printer-is-in-standby-mode

579 The Printer has been shutdown and is only accepting the Restart-Printer (see section 8.1.4) and Get-Printer-  
 580 Attributes operations. An operator can perform the Restart-Printer operation to allow the Printer to accept  
 581 other operations.

## 582 7. New out-of-band values

583 This section defines additional out-of-band values that can be used with any attribute in principle. See the  
 584 beginning of [ipp-mod] section 4.1.

## 585 7.1 'not-settable' out of band value

586 The 'not-settable' out of band value is used by the IPP Printer in a Set-Job-Attributes or Set-Printer-  
 587 Attributes response to indicate an attribute that was supplied, but is not settable in that implementation or as  
 588 defined by the policy for that system, because it is not in the "job-settable-attributes" on the one hand, or the  
 589 "interpreter-settable-attributes" or "printer-settable-attributes", on the other hand.

## 590 8. Summary of Set 2 operations and Operation-Id Assignments

591 The Set 2 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

Operation Name	Operation-Id	Brief description
Disable-Printer	0x??	Prevents the target Printer from accepting create job operations
Restart-Printer	0x??	Restarts the target Printer from a standby shutdown mode
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 or the specified job if it is the current job
Pause-Current-Job	0x??	Pauses the current processing job on the target Printer or the specified job if it is the current job, allowing other jobs to be processed instead
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

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

595

## 596 8.1 Printer Operations

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

## 600 8.1.1 Set-Printer-Attributes Operation

601 Type of registration: operation  
602 Proposed name of this operation: Set-Printer-Attributes  
603 Object Target: Printer  
604 Specification of this operation:

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

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

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

## 614 8.1.1.1 Settable and READ-ONLY Printer Description attributes

615 If the Printer supports the "printer-message-from-operator" Printer Description attribute (see [ipp-mod]  
616 section 4.4.25) and the client explicitly supplies a new value for the "printer-message-from-operator" in the  
617 request, then the Printer **MUST** set the "printer-message-from-operator" Printer attribute to this new value  
618 and **MUST** also set the "printer-message-time", "printer-message-date-time", and "printer-message-  
619 operation" attributes, if supported (see sections 4.4, 4.5, and 4.6).

620 If the Printer supports the Set-Printer-Attributes operation, then it **SHOULD** support setting of:

621 all Job Template Default ("xxx-default") attributes  
622 all Job Template Supported ("xxx-supported") attributes  
623 all Job Template Ready ("xxx-ready") attributes

624 that the implementation supports (see [ipp-mod] section 4.2 and extensions).

625 The following Printer Description attributes (see [ipp-mod] section 4.4) **MUST NOT** be settable, i.e., they  
626 are **READ-ONLY**:

627 printer-state  
628 printer-state-reasons  
629 printer-state-message  
630 printer-is-accepting-jobs - see Enable-Printer/Disable-Printer  
631 queued-job-count  
632 printer-message-time - see Set-Printer-Attributes when setting "printer-message-from-operator"  
633 printer-message-date-time - see Set-Printer-Attributes when setting "printer-message-from-operator"  
634 printer-message-operation - see Set-Printer-Attributes when setting "printer-message-from-operator"  
635 printer-up-time

636 The remaining Printer Description attributes MAY be settable using the Set-Printer-Attributes operation,  
637 depending on implementation. If "xxx-supported" Printer Description attribute are settable, then they  
638 MUST affect the behavior of the implementation. If they are READ-ONLY then they reflect the  
639 implementation and cannot be changed using the Set-Printer-Attributes operation. Consider the following  
640 examples:

641 For example, if the "operations-supported" Printer Description attribute (see [ipp-mod] section  
642 4.4.15) is settable, then changing its value MUST affect the operations that the implementation  
643 accepts or rejects. Such an implementation will need to be able to reject values for operations that it  
644 contains no code support for.

645 As another example, if the "ipp-versions-supported" Printer Description attribute (see [ipp-mod]  
646 section 4.4.14) is settable, then changing its value MUST affect the protocol versions that are  
647 accepted or rejected. Such an implementation will need to be able to reject values for operations  
648 that it contains no code support for.

649 See the "factory-settings" operation attribute (see section 3.3) for a way to query the implementation  
650 supported values using the Get-Printer-Attributes operation. See the "reset-function" operation attribute of  
651 the Reset-Device operation (see [ipp-set3]) for a way to restore the values of the Device object to the  
652 factory settings.

653 **ISSUE 04 - Ok not to have a way to reset the values of the Printer object to the factory settings, but only**  
654 **have a way to reset the factory default settings for the Device object?**

655 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
656 operation.

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

660

## 661 8.1.1.2 Set-Printer-Attributes Request

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

## 663 Group 1: Operation Attributes

## 664 Natural Language and Character Set:

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

667

## 668 Target:

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

671

## 672 Requesting User Name:

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

675

676

## 677 "document-format" (mimeMediaType):

678 The client SHOULD supply this attribute. The Printer object MUST support this attribute. This  
679 attribute is useful for a client to select the Interpreter object to which the attribute modification  
680 should be applied. Each Printer object is modeled to contain one or more Interpreter objects. Those  
681 Printer attributes whose values vary from Interpreter to Interpreter, are modeled as Interpreter  
682 objects, while those that do not are Printer object attributes. Thus the target of a Get-Printer-  
683 Attributes or Set-Printer-Attributes operation is either the Printer object or the Interpreter object  
684 identified by the "document-format" operation attribute supplied by the client. Except for Get-  
685 Printer-Attributes and Set-Printer-Attributes, there are no other operations with the Interpreter object  
686 as a target. See [ipp-mod] section 3.2.5.1 "Get-Printer-Attributes Request".

687

688 If a client wants to set an attribute of all of the Interpreter objects to the same value, it can query the  
689 Printer's "document-format-supported" Printer Description attribute and perform separate Set-  
690 Printer-Attributes for each document format supported.

691

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

698

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

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

706  
707 If the client supplies a value for the "document-format" Operation attribute that is not supported by  
708 the Printer, i.e., is not among the values of the Printer object's "document-format-supported"  
709 attribute, the Printer object MUST reject the operation and return the 'client-error-document-format-  
710 not-supported' status code.

711

## 712 Group 2: Printer Attributes

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

720

### 721 8.1.1.3 Set-Printer-Attributes Response

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

#### 723 Group 1: Operation Attributes

##### 724 Status Message:

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

728

##### 729 Natural Language and Character Set:

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

732

#### 733 Group 2: Unsupported Attributes

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

735

736 In the case of attributes that are supported, but are not settable by the implementation, i.e., are not  
737 among the values of the Printer's "settable-attributes" Printer Description attribute (see section 4.1),  
738 the Printer object returns the client-supplied attribute(s) with a substituted value of 'not-supported'  
739 (same out-of-band value as for attributes that are not supported). This value's syntax type is "out-of-  
740 band" and its encoding is defined by special rules for "out-of-band" values in the "Encoding and

741 Transport" document [IPP-PRO]. Its value indicates that the attribute is either not settable or is not  
742 supported at all.

743

## 744 8.1.2 Disable-Printer Operation

745 Type of registration: operation

746 Proposed name of this operation: Disable-Printer

747 Object Target: Printer

748 Specification of this operation:

749 This OPTIONAL operation allows a client to stop the Printer object from accepting jobs, i.e., cause the  
750 Printer to reject subsequent create job operations (Print-Job, Print-URI, and Create-Job operation) and  
751 return the 'server-error-not-accepting-jobs' status code. The Printer still accepts all other operations. All  
752 previously submitted Jobs and currently processing Jobs continue unaffected. The Printer sets the value of  
753 its "printer-is-accepting-jobs" READ-ONLY Printer Description attribute to 'false' (see [ipp-mod] section  
754 4.4.20), no matter what the previous value was. This operation has no immediate effect on the Printer's  
755 "printer-state" and "printer-state-reasons" attributes.

756 Note: Use the Enable-Printer operation (section 8.1.3) to enable a Printer to accept Jobs again.

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

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

761 Whether or not the Disable-Printer operation stops jobs that are submitted using job submission protocols  
762 other than IPP, depends on implementation, i.e., on whether the IPP protocol is being used as a universal  
763 management protocol or just to manage IPP jobs, respectively. See "printer-controls-other-protocols"  
764 (section 4.3).

765 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
766 operation.

767 The Disable-Printer Request and Disable-Printer Response have the same attribute groups and attributes as  
768 the Resume-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new "printer-  
769 message-from-operator" operation attribute (see section 3.1), and with the addition of the following Group  
770 1 operation attribute in the request:

771 "job-type" (type2 keyword):

772 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
773 attribute. The value of this attribute indicates the type of job to be disabled. If the client omits this  
774 attribute, the Printer assumes the 'network-jobs' value.

775

776 Standard keyword values are:

777 'network-jobs' - disable jobs submitted using the create job operations.

778 'walk-up-jobs' - disable jobs submitted locally, such as walkup copy jobs

779 'all-jobs' - disable all type of jobs

780

## 781 8.1.3 Enable-Printer Operation

782 Type of registration: operation

783 Proposed name of this operation: Enable-Printer

784 Object Target: Printer

785 Specification of this operation:

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

792 Note: Use the Disable-Printer operation (section 8.1.2) to stop a Printer from accepting Jobs.

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

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

797 Whether or not the Enable-Printer operation allows acceptance of jobs that are submitted using job  
798 submission protocols other than IPP, depends on implementation, i.e., on whether the IPP protocol is being  
799 used as a universal management protocol or just to manage IPP jobs, respectively. See "printer-controls-  
800 other-protocols" (section 4.3).

801 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
802 operation.

803 The Enable-Printer Request and Enable-Printer Response have the same attribute groups and attributes as  
804 the Resume-Printer operation (see [ipp-mod] sections 3.2.8.1 and 3.2.8.2), including the new "printer-  
805 message-from-operator" operation attribute (see section 3.1), and with the addition of the following Group  
806 1 operation attribute in the request:

807 "job-type" (type2 keyword):

808 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
809 attribute. The value of this attribute indicates the type of job to be enabled. If the client omits this  
810 attribute, the Printer assumes the 'network-jobs' value.

811

812 Standard keyword values are:

813 'network-jobs' - enable jobs submitted using the create job operations.

814 'walk-up-jobs' - enable jobs submitted locally, such as walkup copy jobs

815 'all-jobs' - enable all types of jobs

## 816 8.1.4 Restart-Printer operation

817 Type of registration: operation

818 Proposed name of this operation: Restart-Printer

819 Object Target: Printer

820 Specification of this operation:

821 This OPTIONAL operation allows a client to restart a Printer that has previously been shutdown in standby  
 822 mode (see section 8.1.5). Standby mode is indicated by the Printer's "printer-state" being 'stopped' and its  
 823 "printer-state-reasons" including the 'standby' and 'paused' values. If the Printer is not in standby mode, the  
 824 Printer MUST reject this operation and return the 'client-error-not-possible' status code.

825 **ISSUE 05: What state does the Printer comes back up on Restart-Printer and how can the client control?**  
 826 **Possible alternatives:**

827 a. Restart-Printer always brings the Printer up Disabled ("printer-is-accepting-jobs" = 'false') and  
 828 Paused ("printer-state" = 'stopped', and "printer-state-reasons" = 'paused') which is the state that  
 829 Shutdown-Printer leaves the Printer in. Then the operator issues Enable-Printer and Resume-Printer  
 830 when want to restore normal operation. The client can automatically issues these addition 2  
 831 operations depending on GUI options. Advantages: This is the simplest to implement, allows new  
 832 states to be added without changing the Restart-Printer operation, and can have the same GUI  
 833 interface as b:

834 b. Add a REQUIRED operation attribute to Restart-Printer, something like "printer-condition" with  
 835 values: 'disabled-and-paused', 'enabled-and-paused', and 'enabled-and-idle'.

836 **DENVER MEETING>** There was significant confusion as to the meaning of shutdown. If a shutdown  
 837 operation halts communications to the printer a restart is not possible. It was agreed to include restart  
 838 attributes 'restart-to-standby' (requires a two step process), 'restart-fully', and 'restart-sync'.

839 **ACTION ITEM (Harry Lewis):** make a complete proposal and submit for approval.

840 If the Restart-Printer operation is supported, then the Shutdown-Printer operation MUST be supported,  
 841 since the Restart-Printer operation is meaningful only after a Shutdown-Printer operation has been  
 842 performed. However, if the Shutdown-Printer operation is supported, the Restart-Printer NEED NOT be  
 843 supported.

844 **Issue 06: Why? This is backward, if you ask me (HRL).**

845 **Denver meeting>** Consider "shutdown-attributes" similar to Windows "shutdown". Like:

- 846 – Completely power off (walk to printer to bring it back up)
- 847 – Power off but listen for "restart" - shutdown to standby

848 **Denver meeting>** Also consider restart attributes.

- 849 – Restart to Standby (disabled and paused) (two step bring up)
- 850 – Restart (fully).
- 851 – Restart sych

852 *Access Rights*: Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
853 operation.

854 The Restart-Printer Request and Restart-Printer Response have the same attribute groups and attributes as  
855 the Resume-Printer operation (see [ipp-mod] sections 3.2.8.1 and 3.2.8.2), including the new "printer-  
856 message-from-operator" operation attribute (see section 3.1) and the following Group 1 operation attribute:

857

## 858 8.1.5 Shutdown-Printer Operation

859 Type of registration: operation

860 Proposed name of this operation: Shutdown-Printer

861 Object Target: Printer

862 Specification of this operation:

863 This OPTIONAL operation allows a client to shutdown a Printer, i.e., stop processing jobs and power off in  
864 some implementation-dependent manner. The purpose of Shutdown-Printer is to shutdown the Printer for  
865 an extended period, not to reset the device(s) or modify a Printer attribute. See Reset-Device [ipp-set3] for  
866 the way to reset the device(s). See the Disable-Printer operation (section 8.1.2) for a way for the client to  
867 stop the Printer from accepting Job Creation requests without stopping processing or shutting down.

868 The Printer is disabled immediately (see the Disable-Printer operation in section 8.1.2). The Printer adds  
869 the 'shutdown' value (see [ipp-mod] section 4.4.11) to its "printer-state-reasons" Printer Description  
870 attribute. The "when" operation attribute specifies how much processing occurs before the Printer is paused  
871 (see [ipp-mod] section 3.2.7) and the shutdown is complete. All other requests continue to be accepted  
872 until the printer is powered down.

873 ISSUE 07 - Need to look at life cycle of the Printer versus standby/power-down and the other operations  
874 that can be accepted. There can be appreciable time between acceptance of this operation and when the  
875 final state of the printer, either standby or powered down is reached. Is it ok for non-submission operations  
876 to continue to be accepted during this time? May need 'moving-to-shutdown'. What about 'moving-to-  
877 standby'?

878 TH> Add 'moving-to-shutdown' which the Shutdown-Printer sets  
879 immediately (analogous to 'moving-to-paused'). Then the 'shutdown'  
880 values means that the shutdown has completed (and is only meaningful to  
881 a server implementation that hosts the Printer object). Thus the server  
882 can still respond to a Get-Printer-Attributes operation after the  
883 Printer is shutdown as stated in IPP/1.1.

884  
885 HRL> Is this granularity really achievable enough of a wide enough  
886 variety of environments to be reliable or, in reality, will this be  
887 implementation dependent?

888 Whether or not the Shutdown-Printer operation affects jobs that were submitted to the device using job  
889 submission protocols other than IPP, depends on implementation, i.e., on whether the IPP protocol is being  
890 used as a universal management protocol or just to manage IPP jobs, respectively. See "printer-controls-  
891 other-protocols" (section 4.3).

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

894 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
895 operation.

896 The Shutdown-Printer Request and Shutdown-Printer Response have the same attribute groups and  
897 attributes as the Pause-Printer operation (see [ipp-mod] sections 3.2.7.1 and 3.2.7.2), including the new

898 "printer-message-from-operator" operation attribute (see section 3.1), and with the addition of the following  
899 Group 1 operation attributes in the request:

900 "when" (type2 keyword)

901 The client **OPTIONALLY** supplies this attribute. The Printer object **OPTIONALLY** supports this  
902 attribute, if it supports this operation. The value of this attribute indicates when to pause the printer.  
903 If the client omits this attribute, the Printer assumes the 'after-current-job' value. The 'after-current-  
904 job' value is **REQUIRED** to be supported if the "when" attribute is supported; the remaining values  
905 are **OPTIONAL**.

906 Note: There is no way to query to see which values of the "when" attribute are supported for this or  
907 any other operation. Since this operation is intended for Operators, rather than End-Users, it did not  
908 seem necessary to provide the means to query the supported values.

909

910 Standard keyword values are:

911 'now' - cancel the currently printing job(s) and shutdown the Printer. Jobs in the 'held' and  
912 'pending' state remain in those states.

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

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

917 **ISSUE 08 - Ok to remove the 'after-current-copy' value from Shutdown-Printer?**

918

919 **ISSUE 09 - Ok to have removed the "shutdown-function" operation attribute with values**  
920 **'stand-by' vs. 'power-off' Shutdown-Printer on the grounds that for the Printer object**  
921 **they have no meaning. Power-off is for the Shutdown-Device operation.**

922 "synchronize" (boolean)

923 The client **OPTIONALLY** supplies this attribute. The Printer object **OPTIONALLY** supports this  
924 attribute. This attribute indicates whether or not the printer is to synchronize the checkpoint data for  
925 the current job ("when" = 'now') with the pages that have actually printed. If the value of the "when"  
926 attribute is not 'now' or the "when" attribute is not supplied, then the "synchronize" attribute has no  
927 meaning and the Printer **MUST** ignore it. If this attribute is supported, then a value of 'true' implies  
928 that the Printer will be able to resume the job at the point of synchronization when the Printer is  
929 restarted. If the implementation does not support resuming a job (either automatically or with the  
930 Resume-Job operation) after a Shutdown-Printer with "when" = 'now', then it does not implement  
931 this attribute. In this case, check-pointing implies that the job may be resumed in the future, exactly  
932 from the point and in the state and resource context from which it left off.

933

934

935 If the Printer supports this attribute but the client does not supply it, the Printer is assumed to  
936 perform synchronization ('true' behavior). If the Printer does not support this attribute, the Printer is  
937 assumed to not synchronize ('false' behavior).

938

939

940 **ISSUE 10: Is the current job automatically restarted when the Printer is restarted? Or does some**  
941 **client have to issue a Restart-Job operation?**

942

## 943 8.2 Job Operations

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

## 948 8.2.1 Set-Job-Attributes

949 Type of registration: operation

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

951 Object Target: Job

952 Specification of this operation:

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

956 This operation is almost identical to the Set-Printer-Attributes operation (see section 8.1.1). The only  
957 differences are that the Set-Job-Attributes operation is directed at a Job object rather than a Printer object,  
958 there is no "document-format" operation attribute used when setting a Job object, and the validation is the  
959 same as the create job operations, i.e., depends on the "xxx-supported" Printer Description attributes.

960 The validation of the Set-Job-Attributes request is performed as if the job had been submitted originally  
961 with the new values and with "ipp-attribute-fidelity" set to 'true', i.e., all modified attributes **MUST** be  
962 supported along with the attributes not modified. If such a create job operation would have been accepted,  
963 then the Set-Job-Attributes **MUST** be accepted. If such a create job operation would have been rejected,  
964 then the Set-Job-Attributes **MUST** be rejected and the Job **MUST** be unchanged.

965 The IPP object **MUST** accept or reject the request based on the job's current state and transition the job to  
966 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'

967 8.2.1.1 Settable and READ-ONLY Job Description attributes

968 If the Printer supports the "job-message-from-operator" Job Description attribute (see [ipp-mod] section  
969 4.3.16) and the client explicitly supplies a new value for the "job-message-from-operator" in the request,  
970 then the Printer MUST set the "job-message-from-operator" Job attribute to this new value.

971 If the Printer supports the Set-Job-Attributes operation, then it SHOULD support setting of:  
972 all Job Template ("xxx") attributes (see [ipp-mod] section 4.2 and extensions)  
973 that the implementation supports.

974 The following Job Description attributes (see [ipp-mod] section 4.3) MUST NOT be settable, i.e., they are  
975 READ-ONLY:

976 job-uri  
977 job-id  
978 job-printer-uri  
979 job-more-info  
980 job-originating-user-name - set in create operation  
981 job-state  
982 job-state-reasons  
983 job-state-message  
984 number-of-documents  
985 output-device-assigned  
986 time-at-creation  
987 time-at-processing  
988 time-at-completed  
989 job-printer-up-time  
990 date-time-at-creation  
991 date-time-at-processing  
992 date-time-at-completed  
993 number-of-intervening-jobs  
994 job-k-octets  
995 job-k-octets-processed  
996 job-impressions-completed  
997 job-media-sheets-completed  
998 attributes-charset - set in create operation  
999 attributes-natural-language - set in create operation

1000 The remaining Job Description attributes MAY be settable using the Set-Job-Attributes operation,  
1001 depending on implementation.

1002 Whether or not the Set-Job-Attributes operation affects jobs that are submitted using job submission  
1003 protocols other than IPP, depends on implementation, i.e., on whether the IPP protocol is being used as a  
1004 universal management protocol or just to manage IPP jobs, respectively. See "printer-controls-other-  
1005 protocols" (section 4.3).

1006 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
1007 operation.

#### 1008 8.2.1.2 Set-Job-Attributes Request

1009 The following sets of attributes are part of the Set-Job-Attributes Request:

##### 1010 Group 1: Operation Attributes

1011 Natural Language and Character Set:

1012 The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]  
1013 section 3.1.4.1.

1014

1015 Target:

1016 Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation  
1017 attribute(s) which define the target for this operation as described in [ipp-mod] section 3.1.5.

1018

1019 Requesting User Name:

1020 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as  
1021 described in [ipp-mod] section 8.3.

1024 Group 2: Job Attributes

1025 The client MUST supply a set of Job attributes as defined in [ipp-mod] section 4.2 Job Template  
1026 Attributes ("xxx" attributes) and section 4.3 Job Description Attributes. Each Job attribute supplied  
1027 in Group 2 replaces the value(s) of the corresponding Job attribute on the target Job object. For  
1028 attributes that can have multiple values (1setOf), all values supplied by the client replace all values  
1029 of the corresponding Job object attribute.

1031 8.2.1.3 Set-Job-Attributes Response

1032 The Printer object returns the following sets of attributes as part of the Set-Job-Attributes Response:

1033 Group 1: Operation Attributes

1034 Status Message:

1035 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY  
1036 includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation  
1037 attribute as described in [ipp-mod] sections 13 and 3.1.6.

1038  
1039 Natural Language and Character Set:

1040 The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]  
1041 section 3.1.4.2.

1042  
1043 Group 2: Unsupported Attributes

1044 See [ipp-mod] section 3.1.7 for details on returning Unsupported Attributes.

1045  
1046 The attributes returned are the same as for the create operation with the same new attribute values.  
1047 In the case of attributes that are supported, but are not settable by the implementation, i.e., are not  
1048 among the values of the Printer's "settable-attributes" Printer Description attribute (see section 4.1),  
1049 the Printer object returns the client-supplied attribute(s) with a substituted value of 'not-supported'  
1050 (same out-of-band value as for attributes that are not supported). This value's syntax type is "out-of-  
1051 band" and its encoding is defined by special rules for "out-of-band" values in the "Encoding and  
1052 Transport" document [IPP-PRO]. Its value indicates that the attribute is either not settable or is not  
1053 supported at all.

1054

## 1055 8.2.2 Reprocess-Job Operation

1056 This OPTIONAL operation is a create job operation that allows a client to re-process a copy of a job that  
1057 had been retained in the queue after processing completed, was canceled, or was aborted (see [ipp-mod]  
1058 section 4.3.7.2). This operation is the same as the Restart-Job operation (see [ipp-mod] section 3.3.7),  
1059 except that the Printer creates a new job that is a copy of the target job and the target job is unchanged. The  
1060 new job is assigned new values to the "job-uri" and "job-id" attributes and the new job's Job Description  
1061 attributes that accumulate job progress, such as "job-impressions-completed", "job-media-sheets-  
1062 completed", and "job-k-octets-processed", are initialized to 0 as with any create job operation. The target  
1063 job moves to the Job History after a suitable period, independent of whether one or more Reprocess-Job  
1064 operations have been performed on it.

1065 If the Set-Job-Attributes operation is supported, then the "job-hold-until" operation attribute MUST be  
1066 supported with at least the 'indefinite' value, so that a client can modify the new job before it is scheduled  
1067 for processing using the Set-Job-Attributes operation. After modifying the job, the client can release the  
1068 job for processing, by using the Release-Job operation specifying the newly assigned "job-uri" or "job-id"  
1069 for the new job.

1070

## 1071 8.2.3 Cancel-Current-Job Operation

1072 This OPTIONAL operation allows a client to cancel the current job on the target Printer or the specified job  
1073 if it is the current job on the Printer. See [ipp-mod] section 3.3.3 for the semantics of canceling a job.  
1074 Since a Job might already be marking by the time a Cancel-Current-Job is received, some media sheet  
1075 pages might be printed before the job is actually terminated.

1076 If the client does not supply a "job-id" operation attribute, the Printer MUST accept the request and cancel  
1077 the current job if there is a current job in the 'processing' or 'processing-stopped' state; otherwise, it MUST  
1078 reject the request and return the 'client-error-not-possible' status code. If more than one job is in the  
1079 'processing' or 'processing-stopped' states, the one that is marking is canceled and the others are unaffected.

1080 Warning: On a shared printer, there is a race condition. Between the time that a user issues this operation  
1081 and its acceptance, the current job might change to a different job. If the user or operator is authenticated to  
1082 cancel the new job, the wrong job is canceled. To prevent this race from canceling the wrong job, the client  
1083 MAY supply the "job-id" operation attribute which is checked against the current job's job-id. If the job  
1084 identified by the "job-id" attribute is not the current job on the Printer, i.e., is not in the 'processing' or  
1085 'processing-stopped' states, the Printer MUST reject this operation and return the 'client-error-not-possible'  
1086 status code. Otherwise, the Printer cancels the specified job.

1087 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
1088 operation.

1089 The Cancel-Current-Job Request and Cancel-Current-Job Response have the same attribute groups and  
1090 attributes as the Resume-Printer operation (see [ipp-mod] section 3.2.8), including the new "job-message-  
1091 from-operator" operation attribute (see section 3.2), with the addition of the following Group 1 Operation  
1092 attributes in the request:

1093 "job-id" (integer(1:MAX)):

1094 The client OPTIONALLY supplies this Operation attribute in order to verify that the identified job  
1095 is still the current job on the target Printer object. The IPP object MUST supports this operation  
1096 attribute, if it supports this operation.

1097

## 1098 8.2.4 Pause-Current-Job operation

1099 **ISSUE 11 - Since the semantics of Pause-Current-Job is different from Pause-Printer, in that other jobs are**  
1100 **processed, while this job is stopped, should we have a different name for the verb, such as Suspend-**  
1101 **Current-Job, instead of Pause-Current-Job. Otherwise, users may be mistakenly think that the printer is**  
1102 **paused when the job is paused. If the name is changes, then the 'job-paused' job state reason would also be**  
1103 **changed to 'job-suspended'.**

1104 This OPTIONAL operation allows a client to stop the current job on the target Printer or the specified job if  
1105 it is the current job on the Printer, and allow other jobs to be processed instead. The Printer moves the  
1106 current job or the target job to the 'processing-stopped' state and sets the 'job-paused' value in the job's "job-  
1107 state-reasons" attribute and processes other jobs.

1108 If the client does not supply a "job-id" operation attribute, the Printer MUST accept the request and pause  
1109 the current job if there is a current job in the 'processing' or 'processing-stopped' state; otherwise, it MUST  
1110 reject the request and return the 'client-error-not-possible' status code. If more than one job is in the  
1111 'processing' or 'processing-stopped' states, all of them are paused.

1112 **Warning:** On a shared printer, there is a race condition. Between the time that a user issues this operation  
1113 and its acceptance, the current job might change to a different job. If the user or operator is authenticated to  
1114 pause the new job, the wrong job is paused. To prevent this race from pausing the wrong job, the client  
1115 MAY supply the "job-id" operation attribute which is checked against the current job's job-id. If the job  
1116 identified by the "job-id" attribute is not the current job on the Printer, i.e., is not in the 'processing' or  
1117 'processing-stopped' states, the Printer MUST reject this operation and return the 'client-error-not-possible'  
1118 status code. Otherwise, the Printer pauses the specified job and processed other jobs.

1119 A paused job is resumed using the Resume-Job operation (see section 8.2.5). If the Pause-Current-Job  
1120 operation is supported, then the Resume-Job operation MUST be supported, and vice-versa.

1121 The Printer MUST reject a Release-Job request (and return the 'client-error-not-possible') for a job that has  
1122 been paused , i.e., for a job in the 'processing-stopped' state, with the 'job-paused' value in its "job-state-  
1123 reasons" attribute. The Hold-Job and Release-Job operations are for holding and releasing held jobs, not  
1124 pausing and resuming paused jobs.

1125 **ISSUE 12 - Ok for Pause-Job to reject a request for a Job that is already paused (like Cancel-Job), instead**  
1126 **of accepting the request?**

1127 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
1128 operation.

1129 The Pause-Current-Job Request and Pause-Current-Job Response have the same attribute groups and  
1130 attributes as the Resume-Printer operation (see [ipp-mod] section 3.2.8 ), including the new "job-message-  
1131 from-operator" operation attribute (see section 3.2), with the addition of the following Group 1 Operation  
1132 attributes in the request:

1133 "job-id" (integer(1:MAX)):

1134 The client OPTIONALLY supplies this Operation attribute in order to verify that the identified job  
1135 is still the current job on the target Printer object. The IPP object MUST supports this operation  
1136 attribute, if it supports this operation.

1137 "when" (type2 keyword)

1138 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
1139 attribute, if it supports this operation. The value of this attribute indicates when to pause the printer.  
1140 If the client omits this attribute, the Printer assumes the 'after-current-copy' value. The 'after-  
1141 current-copy' value is REQUIRED to be supported if the "when" attribute is supported; the  
1142 remaining values are OPTIONAL.

1143 Note: There is no way to query to see which values of the "when" attribute are supported for this or  
1144 any other operation. Since this operation is intended for Operators, rather than End-Users, it did not  
1145 seem necessary to provide the means to query the supported values.

1146  
1147 Standard keyword values are:

1148 'now' - pause the current Job immediately, while the current Job is processing.

1149 'after-current-copy' - pause the current Job after the current Job finishes printing its current  
1150 copy.

1151 **ISSUE 13 - Ok that the only values for the "when" operation attribute for the Pause-Current-Job are**  
1152 **'now' and 'after-current-copy' with 'now' being the default and REQUIRED?**

1153

1154 "synchronize" (boolean)

1155 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this  
1156 attribute. This attribute indicates whether or not the printer is to synchronize the checkpoint data for  
1157 the current job being paused with the pages that have actually printed. If this attribute is supported,  
1158 then a value of 'true' implies that the Printer will be able to resume the job at the point of  
1159 synchronization when the job is resumed.

1160

1161 If the Printer supports this attribute but the client does not supply it, the Printer is assumed to  
1162 perform synchronization ('true' behavior). If the Printer does not support this attribute, the Printer is  
1163 assumed to not synchronize ('false' behavior).

1164

## 1165 8.2.5 Resume-Job operation

1166 This OPTIONAL operation allows a client to resume the target job at the point where it was paused. The  
1167 Printer moves the target job to the 'pending' state and removes the 'job-paused' value from the job's "job-  
1168 state-reasons" attribute.

1169 If the target job is not in the 'processing-stopped' state with the 'job-paused' value in the job's "job-state-  
1170 reasons" attribute, the Printer rejects the request and returns the 'client-error-not-possible' status code, since  
1171 the job was not paused.

1172 **ISSUE 14 - Ok to return an error (like Cancel-Job), rather than having Resume-Job accept the request even  
1173 if the Job is already resumed (i.e., not paused)?**

1174 If the Resume-Job operation is supported, then the Pause-Current-Job operation MUST be supported, and  
1175 vice-versa.

1176 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
1177 operation.

1178 The Resume-Job Request and Resume-Job Response have the same attribute groups and attributes as the  
1179 Release-Job operation (see [ipp-mod] section 3.3.6), including the new "job-message-from-operator"  
1180 operation attribute (see section 3.2).

1181

## 1182 8.2.6 Promote-Job operation

1183 This OPTIONAL operation allows a client to make the pending target job be processed next after the  
1184 current job completes. This operation is specially useful in a production printing environment where the  
1185 operator is involved in job scheduling.

1186 If the target job is in the 'pending' state, this operation does not change the job's state, but causes the job to  
1187 be processed after the current job(s) complete. If the target job is not in the 'pending' state, the Printer  
1188 rejects the request and returns the 'client-error-not-possible' status code. The Printer returns the target job  
1189 immediately after the current job(s) in a Get-Jobs response (see [ipp-mod] section 3.2.6) for the 'not-  
1190 completed' jobs.

1191 When the current job completes, is canceled, paused, or aborted, the target of this operation is processed  
1192 next.

1193 If a client issues this request (again) before the target of the operation of the original request started  
1194 processing, the target of this new request is scheduled before the previous job that was to be processed next.

1195 Note: IPP is specified not to require queues for job scheduling, since there are other implementations for  
1196 scheduling multiple jobs. However, if an implementation does implement queues for jobs, then the  
1197 Promote-Job puts the specified job at the front of the queue. A subsequent Promote-Job before the first job  
1198 starts processing puts that specified job at the front of the queue, so that it is "in front" of the previously  
1199 promoted job.

1200 *Access Rights:* Authentication and access control (see [ipp-mod] sections 1, 8.3, and 8.5) apply to this  
1201 operation.

1202 The Promote-Job Request and Promote-Job Response have the same attribute groups and attributes as the  
1203 Cancel-Job operation (see [ipp-mod] section 3.3.3), including the new "job-message-from-operator"  
1204 operation attribute (see section 3.2).

1205

## 1206 9. IANA Considerations

1207 The operations and attributes in this registration proposal will be published by IANA according to the  
1208 procedures in RFC 2566 [rfc2566] section 6.4 for operations with the following URL:

1209 `ftp.isi.edu/iana/assignments/ipp/operations/set2.txt`

## 1210 10. Internationalization Considerations

1211 This document has the same localization considerations as the [ipp-mod].

## 1212 11. Security Considerations

1213 The IPP Model and Semantics document [ipp-mod] discusses high level security requirements (Client  
1214 Authentication, Server Authentication and Operation Privacy). Client Authentication is the mechanism by  
1215 which the client proves its identity to the server in a secure manner. Server Authentication is the mechanism  
1216 by which the server proves its identity to the client in a secure manner. Operation Privacy is defined as a  
1217 mechanism for protecting operations from eavesdropping.

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1244 13. References

1245 [ipp-mod]

1246 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and  
1247 Semantics", <draft-ietf-ipp-model-v11-03.txt>, June, 1999.

1248 [RFC2566]

1249 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and  
1250 Semantics", RFC 2566, April 1999.

1251 14. Change History

1252 This section summarizes the changes. Each sub-section is in reverse chronological order.

1253 14.1 Changes to the October 22, 1999 version to make the November 1, 1999 version

1254 Adding or removing ISSUES that don't change the document are not listed here. The following changes to  
1255 the October 22, 1999 version to make the November 1, 1999 version as a result of the IPP WG meeting in  
1256 Durham, 10/99:

- 1257 1. Removed the Reset-Printer, Non-Process-Run-Out, and Space-Current-Job operations from this Set2  
1258 spec and moved them to a new Set3 spec for use with the new Device object, renaming them  
1259 appropriately, to Reset-Device, Non-Process-Run-Out-Device, and Space-Device.
- 1260 2. Add the concept of parent and subordinate Printer objects to formally represent fan-out. Mentioned the  
1261 Device object that is in a new [ipp-set3] spec.
- 1262 3. Distributed the definition of the "when" operation attribute to the Pause-Printer (IPP/1.1), Shutdown-  
1263 Printer, and Pause-Current-Job operations and listed the values that are appropriate to that operation  
1264 only:  
1265 Pause-Printer: 'now', 'after-current-copy', 'after-current-job' (default), and 'after-all'.  
1266 Shutdown-Printer: 'now', 'after-current-job' (default), and 'after-all'  
1267 Pause-Current-Job: 'now', 'after-current-copy' (default)
- 1268 4. Deleted the "device-name" operation attribute and the "device-names-supported" (1setOf name(127))  
1269 Printer Description attribute. The latter will be part of the [ipp-set3] document.

1270 5. Kept the "job-settable-attributes" (1setOf type2 keyword) and "printer-settable-attributes" (1setOf type2  
1271 keyword), but deleted the "interpreter-settable-attributes" (1setOf type2 keyword), since the Interpreter  
1272 object and its attributes are really a sub-class of the Printer object.

1273 6. Deleted the "when-values-supported" (1setOf type2 keyword) Printer Description attribute.

1274 7. Added the "subordinate-printers-supported" (1setOf uri) Printer Description attribute.

1275 14.2 Changes to the September 19, 1999 version to make the October 22, 1999 version

1276 Adding or removing ISSUES that don't change the document are not listed here. The following changes to  
1277 the September 19, 1999 version to make the October 22, 1999 version as a result of the IPP WG meeting in  
1278 Denver, 9/99:

1279 1. Added the Interpreter object.

1280 2. Added the "device-name" operation attribute to handle passing operations through the IPP Printer object  
1281 to the device.

1282 3. Added the out-of-band 'not-settable' to allow the Set-Job-Attributes and Set-Printer-Attributes response  
1283 to indicate the difference between an unsupported attribute and a supported, but not settable, attribute in  
1284 the Unsupported Attributes Group.

1285 4. Removed "when-values-supported" and "job-settable-attributes" and "printer-settable-attributes" and  
1286 "interpreter-settable-attributes" from the list of attributes that MUST be read-only. So an administrator  
1287 could sub-set the policy on what when values are supported or which attributes can be set.

1288 14.3 Changes to the July 19, 1999 version to make the September 19, 1999 version

1289 The following changes to the July 19, 1999 version to make the September 19, 1999 version as a result of  
1290 the IPP WG meeting in Alaska, 8/99:

1291 1. Refer to proposal as "Set2" rather than "Administrative" operations.

1292 2. Revise the emphasis on administrator throughout the document, although the word administrator  
1293 remains wherever appropriate.

1294 3. Convert non-process-run-out from an operations attribute to an operation.

1295 4. Added Issue 21: For all these "access" caveats, why not just say... 'authentication and access control  
1296 (see ipp-mod sections 1, 8.3 and 8.5) applies to this operation' .?

1297 5. Added Issue 22: Why? This is backward, if you ask me (HRL).

1298 6. Per resolution of Issue 2, the "settable-attributes" Printer Description attribute, was replaced with three  
1299 Printer Description attributes: "printer-settable-attributes", "job-settable-attributes", and "interpreter-

1300       settable-attributes". The latter for those implementations that have different values for Printer attributes  
1301       in the Get-Printer-Attributes and Set-Printer-Attributes operations, depending on the value of the  
1302       "document-format" operation attribute supplied by the client. If and when we get a Document object,  
1303       then we can add a "document-settable-attributes" Printer Description attribute.

#### 1304   14.4 Changes to the June 30, 1999 version to make the July 19, 1999 version

1305   The following changes to the June 30, 1999 version to make the July 19, 1999 version as a result of the IPP  
1306   WG meeting in Copenhagen, 7/7/99-7/8/99, and the IPP telecon, 7/14/1999:

- 1307   1. Sections 2.1 and 2.2: Clarified that the way to remove a message from the operator was for the client to  
1308       supply a zero-length or all white space text string which is copied as usual to the "xxx-message-from-  
1309       operator" attribute.
- 1310   2. Section 2.3: Added "factory-settings" (boolean) operation attribute to the Get-Printer-Attributes  
1311       operation.
- 1312   3. Section 2.4: Added the "when" operation attribute to the Pause-Current-Job operation.
- 1313   4. Section 2.4: Made the "when" operation attribute OPTIONAL for use in operations (Pause-Printer,  
1314       Reset-Printer, Shutdown-Printer, and Pause-Current-Job operations).
- 1315   5. Sections 2.5: Added table of operation attributes for the Printer operations to make it easy to compare.
- 1316   6. Sections 2.6: Added table of operation attributes for the Job operations to make it easy to compare.
- 1317   7. Section 3.1: Added "settable-attributes" (1setOf type2 keyword) READ-ONLY Printer Description  
1318       attribute.
- 1319   8. Section 3.2: Added "printer-controls-other-protocols" (boolean) Printer Description attribute
- 1320   9. Section 3.3: Added the READ-ONLY "printer-message-time" (integer(MIN:MAX)) Printer  
1321       Description attribute to keep time message updated in time ticks.
- 1322   10. Section 4.2: Deleted the 'process-next' "job-state-reasons" value, so that repeated Promote-Job  
1323       operations promote each job "to the front of the queue".
- 1324   11. Sections 6.1.1.1 and 6.2.1.1: Replaced the table that listed all attributes with one that lists only the  
1325       attributes that MUST be READ-ONLY.
- 1326   12. Section 6.1.1.1: Indicated that attributes that are not specified as READ-ONLY in this document MAY  
1327       be settable. If they control behavior, that changing their values MUST change the behavior.
- 1328   13. Section 6.1.1.2 and 6.2.1.2: Deleted the "ipp-attribute-fidelity" operation attribute from the Set-Printer-  
1329       Attributes and Set-Job-Attributes operations. All set operations are atomic.

- 1330 14. Section 6.1.1.2: Add the concept of the Interpreter object to handle attributes whose values vary in the  
1331 Set-Printer-Attributes and Get-Printer-Attributes, depending on the value of the "document-format"  
1332 operation attribute.
- 1333 15. Sections 6.1.1.3 and 6.2.1.2: Changed the "out-of-band" 'not-settable' value back to the existing 'not-  
1334 supported' value.
- 1335 16. Section 6.1.2 and 6.1.3: Added "job-type" operation attribute to Disable-Printer and Enable-Printer  
1336 operations with values: 'network-jobs', 'walk-up-jobs', and 'all-jobs'.
- 1337 17. Section 6.1.5: Clarified that Restart-Printer brings up the Printer disabled and paused, since that is the  
1338 eventual state that Shutdown-Printer leaves the printer in.
- 1339 18. Section 6.1.5: Indicated that if Restart-Printer is supported, then Shutdown-Printer MUST be  
1340 supported.
- 1341 19. Section 6.1.6: Deleted Space-Printer operation. Keep Space-Current-Job operation only which has a  
1342 "job-id" operation attribute that a client MAY supply.
- 1343 20. Section 6.1.6: Clarified that Shutdown-Printer is for a long period of time, not just to reset the device or  
1344 change attribute values. Also that Shutdown performs an immediate Disable-Printer and an eventual  
1345 Pause-Printer.
- 1346 21. Sections 6.2.3, 6.2.4, and 6.2.7 : Added a "job-id" operation attribute to Cancel-Current-Job, Pause-  
1347 Current-Job, and Space-Current-Job that a client MAY supply to check for race condition where current  
1348 job changes
- 1349 22. Section 6.2.4: Combined Pause-Job into Pause-Current-Job operation.
- 1350 23. Sections 6.2.4 and 6.2.5: Pause-Current-Job puts job in 'processing-stopped' state, not 'pending-held'  
1351 state.
- 1352 24. Section 6.2.6: Simplified Promote-Job, so that it behaves as if the job were put at the front of the  
1353 queue.

1354 15. Appendix A: Full Copyright Statement

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