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## Internet Printing Protocol/1.0: Additional Optional Operations - Set 1

### 15 Status of this Memo

16 This document is a Printer Working Group (PWG) DRAFT. The previous version  
17 (~~980727980920~~) was posted to the IPP mailing list for comment on ~~7/29/98~~9/20/98 and reviewed  
18 at the ~~August, 19-20~~September 30, 1998 PWG meeting in ~~Toronto~~Savannah. This version  
19 contains the changes agreed to at that meeting, ~~and the IPP telecons on 9/2/98, 9/9/98, and~~  
20 ~~9/16/98~~ and need to be reviewed by the participants on the mailing list using the Last Call PWG  
21 procedures.

### 22 Abstract

23 This document specifies six OPTIONAL operations for use with the Internet Printing  
24 Protocol/1.0 (IPP) [ipp-mod, ipp-pro]. The defined Set 1 operations are 3 Job object operations  
25 that end-users may perform on their jobs and operators/administrators may perform on any job:

26 Hold-Job  
27 Release-Job  
28 Restart-Job

29 and 3 Printer object operations that operators/administrators may perform on a Printer object:

30 Pause-Printer  
31 Resume-Printer  
32 Purge-Jobs

33

34

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## 52 1 Summary of Set 1 and Operation-Id Assignments

53 The Set 1 operations are summarized in the following table:

Operation Name	Operation-Id	Brief description
Hold-Job	0x000C	Holds a pending job so that it cannot be scheduled for processing
Release-Job	0x000D	Allows a previously held job to be scheduled for processing
Restart-Job	0x000E	Restarts a job as the same job on the same Printer object
	0x000F	Reserved for the future.
Pause-Printer	0x0010	Stops the device(s) as soon as possible from processing jobs
Resume-Printer	0x0011	Resumes the device(s) processing jobs
Purge-Jobs	0x0012	Removes all jobs from the Printer regardless of job state

54 All of the operations in Set 1 are OPTIONAL for an IPP object to support. Unless the  
 55 specification of an OPTIONAL operation requires support of another OPTIONAL operation,  
 56 conforming implementations may support any combination of these operations.

## 57 2 Job Operations

58 The job operations in Set 1 are for use by end users on their jobs and by operators and  
 59 administrators on any jobs. The operation attributes in requests and responses for the job  
 60 operations are the same as the standard Cancel-Job operation (see [model] 3.3.3). Additional  
 61 operation attributes are specified that the client MAY supply in a request. ~~In addition, the IPP  
 62 object MUST return the "job-state" [ipp-mod 4.3.7] attribute and, if supported, the "job-state-  
 63 reasons" [ipp-mod 4.3.8] attribute in the response as Group 3 Job Attributes in order to indicate  
 64 the effect of the operation on the job object.~~

### 65 2.1 Hold-Job

66 This operation allows a client to hold a pending job in the queue so that it is not eligible for  
 67 scheduling. If the Hold-Job operation is supported, then the Release-Job operation MUST be  
 68 supported, and vice-versa.

#### 69 2.1.1 "job-hold-until" (type3 keyword | name(MAX)) operation attribute

70 The client OPTIONALLY supplies this attribute. The IPP object MUST support this operation  
 71 attribute in a Hold-Job request, if it supports the "job-hold-until" Job template attribute in create  
 72 operations. See [ipp-mod] section 4.2.2. Otherwise, the IPP object NEED NOT support the

73 "job-hold-until" operation attribute in a Hold-Job request. If supplied and supported as specified  
 74 in the Printer's "job-hold-until-supported" attribute, the IPP object copies the attribute to the Job  
 75 object, replacing the job's previous "job-hold-until" attribute, if present, and makes the job a  
 76 candidate for scheduling during the supplied named time period.

77 As with all operations, if the client supplies the "job-hold-until" (or any OPTIONAL) Operation  
 78 attribute that is unknown or unsupported or the value is unsupported, the IPP object MUST  
 79 accept and perform the operation, ignoring the unknown or unsupported operation attribute and  
 80 returning the ignored or unsupported attributes and/or values in Group 2 Unsupported Attributes  
 81 (see [ipp-mod] sections 3.3.3.2 and 16.3.6).

82 If the client (1) supplies a value that specifies a time period that has already started or the 'no-  
 83 hold' value [ipp-mod 4.2.2] (meaning don't hold the job) and (2) the IPP object supports the "job-  
 84 hold-until" operation attribute and there are no other reasons to hold the job, the IPP object  
 85 MUST accept the operation and make the job be a candidate for processing immediately (see  
 86 [ipp-mod] Section 4.2.2).

87 The following new keyword value is defined for use with the "job-hold-until" Job Template  
 88 attribute in job create operations and the "job-hold-until" operation attribute in Hold-Job and  
 89 Restart-Job operations:

90        'indefinite': - the job is held indefinitely, until a client performs a Release-Job or Restart-  
 91        Job operation

92 If the client does not supply a "job-hold-until" operation attribute in the request, the IPP object  
 93 MUST populate the job object with a "job-hold-until" attribute with the 'indefinite' value (if IPP  
 94 object supports the "job-hold-until" attribute) and hold the job indefinitely, until a client performs  
 95 a Release-Job or Restart-Job operation.

96 The IPP object SHOULD support the "job-hold-until" Job Template attribute for use in job create  
 97 operations with at least the 'indefinite' value, if it supports the Hold-Job operation. Otherwise, a  
 98 client cannot create a job and hold it immediately (without picking some supported time period  
 99 in the future).

100 The IPP object MUST accept or reject the request based on the job's current state, transition the  
 101 job to the indicated new state, ~~and return the indicated new "job-state" attribute and status code~~  
 102 as follows:

Current "job-state"	New "job-state"	IPP object's response status code and action:
'pending'	'pending-held'	'successful-ok' See Note 1
'pending'	'pending'	'successful-ok' See Note 2
'pending-held'	'pending-held'	'successful-ok' See Note 1
'pending-held'	'pending'	'successful-ok' See Note 2

'processing'	'processing'	'client-error-not-possible'
'processing-stopped'	'processing-stopped'	'client-error-not-possible'
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

103 Note 1: If the OPTIONAL "job-state-reasons" attribute is supported and if the implementation  
 104 supports multiple reasons for a job to be in the 'pending-held' state, the IPP object MUST add the  
 105 'job-hold-until-specified' value to the job's "job-state-reasons" attribute.

106 Note 2: If the IPP object supports the "job-hold-until" operation attribute, but the specified time  
 107 period has already started (or is the 'no-hold' value) and there are no other reasons to hold the job,  
 108 the IPP object MUST make the job be a candidate for processing immediately (see [ipp-mod]  
 109 Section 4.2.2) by putting the job in the 'pending' state.

110 Note: In order to keep the Hold-Job operation simple, such a request is rejected when the job is  
 111 in the 'processing' or 'processing-stopped' states. If an operation is needed to hold jobs while in  
 112 these states, it will be added as an additional operation, rather than overloading the Hold-Job  
 113 operation. Then it is clear to clients by querying the Printer object's "operations-supported" [ipp-  
 114 mod 4.4.13] and the Job object's "job-state" [ipp-mod 4.3.7] attributes which operations are  
 115 possible.

116 *Access Rights:* The requesting user must either be the submitter of the job or an operator or  
 117 administrator of the Printer object (see [ipp-mod] Section 1). Otherwise, the IPP object MUST  
 118 reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-  
 119 error-not-authorized' as appropriate.

## 120 2.2 Release-Job

121 This operation allows a client to release a previously held job so that it is again eligible for  
 122 scheduling. This operation removes the "job-hold-until" job attribute, if present, from the job  
 123 object that had been supplied in the create or most recent Hold-Job or Restart-Job operation and  
 124 remove its effect on the job.

125 If the Hold-Job operation is supported, then the Release-Job operation MUST be supported, and  
 126 vice-versa.

127 If the OPTIONAL "job-state-reasons" attribute is supported, the IPP object MUST remove the  
 128 'job-hold-until-specified' value from the job's "job-state-reasons" attribute, if present.

129 The IPP object MUST accept or reject the request based on the job's current state, transition the  
 130 job to the indicated new state, ~~and return the indicated new "job-state" attribute and status code~~  
 131 as follows:

Current "job-state"	New "job-state"	IPP object's response status code and action:
'pending'	'pending'	'successful-ok' No effect on the job.

'pending-held'	'pending-held'	'successful-ok' See Note 1
'pending-held'	'pending'	'successful-ok'
'processing'	'processing'	'successful-ok' No effect on the job.
'processing-stopped'	'processing-stopped'	'successful-ok' No effect on the job.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

132 Note 1: If there are other reasons to keep the job in the 'pending-held' state, such as 'resources-  
 133 are-not-ready', the job remains in the 'pending-held' state. Thus the 'pending-held' state is not just  
 134 for jobs that have the 'job-hold-until' applied to them, but are for any reason to keep the job from  
 135 being a candidate for scheduling and processing, such as 'resources-are-not-ready'. See the "job-  
 136 hold-until" attribute ([ipp-mod] Section 4.2.2).

137 *Access Rights:* The requesting user must either be the submitter of the job or an operator or  
 138 administrator of the Printer object. Otherwise, the IPP object MUST reject the operation and  
 139 return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as  
 140 appropriate.

141 **2.3 Restart-Job**

142 This operation allows a client to restart a job that is retained in the queue after processing has  
 143 completed. As an implementation option, a job in the 'processing' and/or 'processing-stopped'  
 144 states MAY be restarted.

145 The job is moved to the 'pending' job state and restarts at the beginning on the same IPP Printer  
 146 object with the same attribute values. The Job Description attributes that accumulate job  
 147 progress, such as "job-impressions-completed", "job-media-sheets-completed", and "job-k-  
 148 octets-processed", MUST be reset to 0 so that they give an accurate record of the job from its  
 149 restart point. The job object MUST continue to use the same "job-uri" and "job-id" attribute  
 150 values.

151 **2.3.1 "job-hold-until" (type3 keyword | name(MAX)) operation attribute**

152 The client OPTIONALLY supplies this attribute. The IPP object MUST support this operation  
 153 attribute in a Restart-Job request, if it supports the "job-hold-until" Job template attribute in  
 154 create operations. See [ipp-mod] section 4.2.2. Otherwise, the IPP object NEED NOT support  
 155 the "job-hold-until" operation attribute in a Restart-Job request. If supplied and supported, the  
 156 IPP object copies the attribute to the Job object, replacing the job's previous "job-hold-until"  
 157 attribute, if present, and makes the job a candidate for scheduling during the supplied named time  
 158 period.

159 See Section 2.1.1 for the common semantics of the "job-hold-until" operation attribute for the  
160 Hold-Job operation and Restart-Job operation.

161 Note: In the future an OPTIONAL Modify-Job operation may be specified that allows the client  
162 to modify other attributes before releasing the restarted job.

163 The IPP object MUST accept or reject the request based on the job's current state, transition the  
164 job (or new job, depending on implementation) to the indicated new state, ~~and return the~~  
165 ~~indicated new "job-state" attribute and status code~~ as follows:

Current "job-state"	New "job-state"	IPP object's response status code and action:
'pending'	'pending'	'client-error-not-possible'.
'pending-held'	'pending-held'	'client-error-not-possible'.
'processing'	'pending'	OPTION 1: 'successful-ok' - job is started over. See Note 1.
'processing'	'processing'	OPTION 2: 'client-error-not-possible'.
'processing-stopped'	'pending'	OPTION 1: 'successful-ok' - job is started over. See Note 1
'processing-stopped'	'processing-stopped'	OPTION 2: 'client-error-not-possible'.
'completed'	'pending'	'successful-ok' - job is started over.
'canceled'	'pending'	'successful-ok' - job is started over.
'aborted'	'pending'	'successful-ok' - job is started over.

166

167 Note 1: For OPTION 1, the IPP object SHOULD indicate to clients that a Restart-Job operation  
168 is possible while the job is in the 'processing' and/or 'processing-stopped' states, by populating the  
169 job's "job-state-reasons" attribute with the 'job-restartable' value.

170 *Access Rights:* The requesting user must either be the submitter of the job or an operator or  
171 administrator of the Printer object. Otherwise, the IPP object MUST reject the operation and  
172 return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as  
173 appropriate.

### 174 **3 The Job History concept and additional "job-state-reasons"**

175 This section explains the so-called Printer object's "job-history" that contains the recently  
176 completed, canceled, and aborted jobs. This section also specifies the 'job-restartable' value of  
177 the "job-state-reasons" Job Description attribute for use with the Restart-Job operations.

#### 178 **3.1 The "job history" concept**

179 When a job is completed, canceled, or aborted, the IPP Printer object MAY retain the job with its  
180 document data in a restartable condition using the Restart-Job operation for an implementation-  
181 defined time period which may be zero seconds. If the IPP object supports the "job-state-

182 reasons" attribute and the Restart-Job operation, then it SHOULD indicate that such jobs are  
183 restartable by adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see  
184 Section 3.2) during that implementation-defined time period.

185 After the implementation-defined restartable time period expires, the Printer object deletes the  
186 document data for the job and the job becomes part of the "job history". The Print object MAY  
187 also delete any number of the job attributes. Since the job is no longer restartable, the Printer  
188 object MUST remove the 'job-restartable' value from the job's "job-state-reasons" attribute, if  
189 supported. Clients are able to query jobs in the Printer object's "job history" using Get-Job-  
190 Attributes and Get-Jobs operations.

191 Subsequently, the IPP Printer removes jobs from its "job history" in an implementation-defined  
192 manner, such as after a fixed time period (which MAY be zero seconds) or when the number of  
193 jobs exceeds a fixed number. Thereupon, the job can no longer be queried using the Get-Job-  
194 Attributes and Get-Jobs operations and the IPP object returns the 'client-error-not-found' or  
195 'client-error-gone' as appropriate.

### 196 **3.2 Add a new 'job-restartable' value to the "job-state-reasons" attribute**

197 The following new keyword value is specified for use with the "job-state-reasons" Job  
198 Description attribute and the Restart-Job operation (see Section 2.3):

199 'job-restartable' - This job is currently able to be restarted using the Restart-Job operation.  
200 With which job states this value is used depends on implementation, i.e., OPTION 1 vs.  
201 OPTION 2 in the job state transition table in Section 2.3. Whenever the IPP object will  
202 reject a Restart-Job operation for the job with the 'client-error-not-possible' error status  
203 code because the job is not restartable, the IPP object MUST remove this value from the  
204 job's "job-state-reasons" attribute.

205

206 For example, after a job is completed (job state is 'completed', 'aborted', or 'canceled), the  
207 implementation MAY retain the job in a restartable condition for an implementation-  
208 defined time period. When that time elapses, an implementation MAY delete the  
209 document data, but MAY retain some or all of the job attributes as a "job history" for an  
210 additional implementation-defined time period. During this second time period, the  
211 implementation removes the 'job-restartable' value from the job's "job-state-reasons"  
212 attribute, since the job can no longer be restarted.

213



214 **4 Printer operations**

215 The printer operations in Set 1 are for use by operators and administrators of each Printer object.  
 216 The following figure is copied from [ipp-mod] with the addition of the following arrow:

217 any\*\*\*\*>

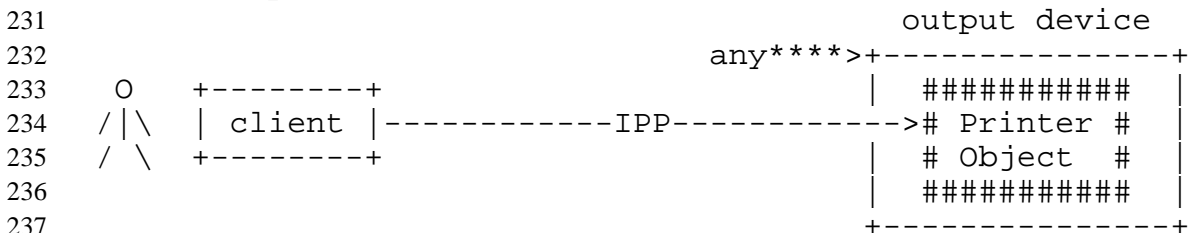
218 indicating an additional source of job submission using IPP or any other job submission protocol  
 219 that passes to the device but does NOT pass through the IPP Printer object in question.

220 Legend:

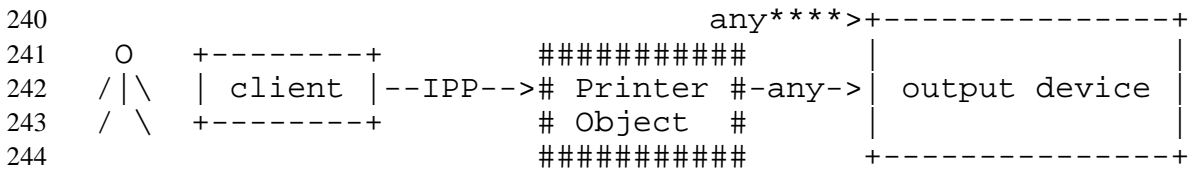
221  
 222 ##### indicates a Printer object which is  
 223 either embedded in an output device or is  
 224 hosted in a server. The Printer object  
 225 might or might not be capable of queuing/spooling.

226  
 227 any indicates any network protocol or direct  
 228 connect, including IPP

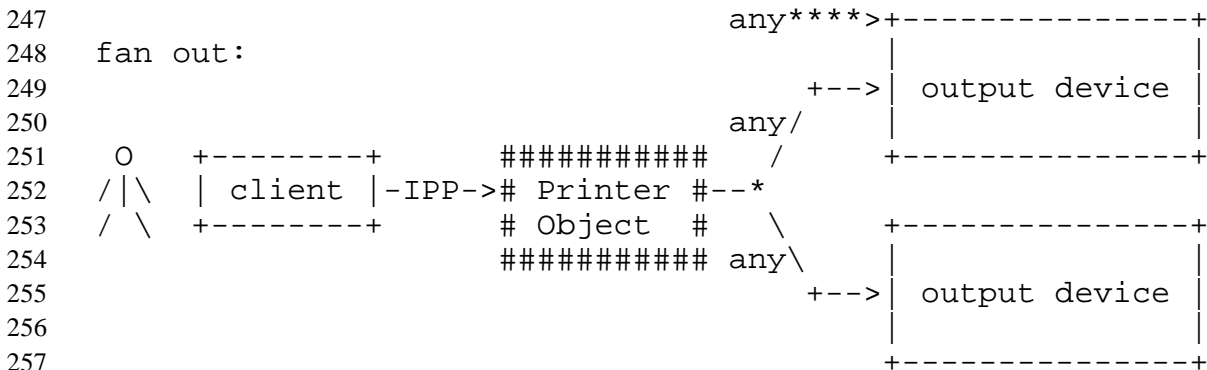
229  
 230 embedded printer:



239 hosted printer:



246  
 247 fan out:



258 The operation attributes for the Printer operation requests are as follows:-

259 Group 1: Operation Attributes

260 Natural Language and Character Set:

261 The "attributes-charset" and "attributes-natural-language" attributes as described in  
262 section 3.1.4.1 of [ipp-mod].

263

264 Target:

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

267

268 Requesting User Name:

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

271 The operation attributes for the Printer operation responses are as follows:

272 Group 1: Operation Attributes

273 Status Message:

274 In addition to the REQUIRED status code returned in every response, the response  
275 OPTIONALLY includes a "status-message" (text) operation attribute as described in  
276 section 3.1.6 of [ipp-mod].

277

278 Natural Language and Character Set:

279 The "attributes-charset" and "attributes-natural-language" attributes as described in  
280 section 3.1.4.2 of [ipp-mod].

281

282 Group 2: Unsupported Attributes

283 This is a set of Operation attributes supplied by the client (in the request) that are not  
284 supported by the Printer object or that conflict with one another (see sections 3.2.1.2 and  
285 16).

286

287 ~~Group 3: Printer Object Attributes~~

288 ~~Printer state information:~~

289 ~~The Printer object MUST return the "printer-state" [ipp-mod 4.4.10] and, if supported, the~~  
290 ~~"printer-state-reasons" [ipp-mod 4.4.11] attributes in order to indicate the effect of the~~  
291 ~~operation on the Printer object.~~

292 **4.1 Pause-Printer**

293 This operation allows a client to stop the Printer object from scheduling jobs on all its devices.  
 294 Depending on implementation, the Pause-Printer operation MAY also stop the Printer from  
 295 processing the current job or jobs. Any job that is currently being printed is either stopped as  
 296 soon as the implementation permits or is completed, depending on implementation. The Printer  
 297 object MUST still accept create operations to create new jobs, but MUST prevent any jobs from  
 298 entering the 'processing' state.

299 If the Pause-Printer operation is supported, then the Resume-Printer operation MUST be  
 300 supported, and vice-versa.

301 The IPP Printer stops the current job(s) on its device(s) that were in the 'processing' or  
 302 'processing-stopped' states as soon as the implementation permits. If the implementation  
 303 supports the "printer-state-reasons" attribute and the devices will take appreciable time to stop,  
 304 the IPP Printer adds the 'moving-to-paused' value to the Printer object's "printer-state-reasons"  
 305 attribute. When the device(s) have all stopped, the IPP Printer transitions the Printer object to the  
 306 'stopped' state, removes the 'moving-to-paused' value, if present, and adds the 'paused' value to  
 307 the Printer object's "printer-state-reasons" attribute.

308 When the current job(s) complete that were in the 'processing' state, the IPP Printer transitions  
 309 them to the 'completed' state. When the current job(s) stop in mid processing that were in the  
 310 'processing' state, the IPP Printer transitions them to the 'processing-stopped' state and, if the  
 311 "job-state-reasons" attribute is supported, adds the 'printer-stopped' value to the job's "job-state-  
 312 reasons" attribute.

313 Note: for any jobs that are 'pending' or 'pending-held', the 'printer-stopped' value of the jobs'  
 314 "job-state-reasons" attribute also applies. However, the IPP Printer NEED NOT update those  
 315 job's "job-state-reasons" attributes and only need return the 'printer-stopped' value when those  
 316 jobs are queried (so-called "lazy evaluation").

317 Whether the Pause-Printer operation affects jobs that were submitted to the device from other  
 318 sources than the IPP Printer object (see the any\*\*\*> arrow in the figure above) in the same  
 319 way that the Pause-Printer operation affects jobs that were submitted to the IPP Printer object  
 320 using IPP, depends on implementation, i.e., on whether the IPP protocol is being used as a  
 321 universal management protocol or just to manage IPP jobs, respectively.

322 The IPP Printer MUST accept the request in any state, transition the Printer to the indicated new  
 323 "printer-state" before returning, ~~and return the indicated "printer-state", "printer-state-reasons",~~  
 324 ~~and status code~~ as follows:

Current "printer-state"	New "printer-state" <i>returned</i>	"printer-state-reasons"	IPP Printer's response status code and action:
'idle'	'stopped'	'paused'	'successful-ok'
'processing'	'processing'	'moving-to-	OPTION 1: 'successful-ok';

		paused'	Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute
'processing'	'stopped'	'paused'	OPTION 2: 'successful-ok'; all output stopped immediately
'stopped'	'stopped'	'paused'	'successful-ok'

325 *Access Rights:* The requesting user must be an operator or administrator of the Printer object.  
 326 Otherwise, the IPP Printer MUST reject the operation and return: 'client-error-forbidden', 'client-  
 327 error-not-authenticated', or 'client-error-not-authorized' as appropriate.

328 **4.1.1 Add a new 'moving-to-paused' value to the "printer-state-reasons" attribute**

329 The following new keyword value is specified for use with the "printer-state-reasons" Printer  
 330 Description attribute:

331 'moving-to-paused': The Printer object's operator or administrator has paused the Printer  
 332 object using the Pause-Printer operation or other means, but it has not yet stopped  
 333 producing output. When all the devices stop producing output, the Printer object MUST  
 334 replace this value with the 'paused' value.

335 **4.2 Resume-Printer**

336 This operation allows a client to resume the Printer object scheduling jobs on all its devices. If  
 337 the Printer object supports the "printer-state-reasons" attribute, it MUST remove the 'paused' and  
 338 'moving-to-paused' values from the Printer object's "printer-state-reasons" attribute, if present. If  
 339 there are no other reasons to keep a device paused (such as media-jam), the IPP Printer  
 340 transitions itself to the 'processing' or 'idle' states, depending on whether there are jobs to be  
 341 processed or not, respectively, and the device(s) resume processing jobs.

342 If the Pause-Printer operation is supported, then the Resume-Printer operation MUST be  
 343 supported, and vice-versa.

344 The IPP Printer removes the 'printer-stopped' value from any job's "job-state-reasons" attributes  
 345 contained in that Printer.

346 The IPP Printer MUST accept the request in any state, transition the Printer object to the  
 347 indicated new state, ~~and return the indicated "printer state" and status code~~ as follows:

Current "printer-state"	New "printer-state" <del>returned</del>	IPP Printer's response status code and action:
'idle'	'idle'	'successful-ok'
'processing'	'processing'	'successful-ok'
'stopped'	'processing'	'successful-ok';

		when there are jobs to be processed
'stopped'	'idle'	'successful-ok'; when there are no jobs to be processed.

348 *Access Rights:* The requesting user must be an operator or administrator of the Printer object.  
 349 Otherwise, the IPP Printer MUST reject the operation and return: 'client-error-forbidden', 'client-  
 350 error-not-authenticated', or 'client-error-not-authorized' as appropriate.

351 **4.3 Purge-Jobs**

352 This operation allows a client to remove all jobs from an IPP Printer object, regardless of their  
 353 job states, including jobs in the Printer object's "job-history" (see Section 3.1). After a Purge-  
 354 Jobs operation has been performed, a Printer object MUST return no jobs in subsequent Get-Job-  
 355 Attributes and Get-Jobs responses (until new jobs are submitted).

356 Whether the Purge-Jobs (and Get-Jobs) operation affects jobs that were submitted to the device  
 357 from other sources than the IPP Printer object (see the any\*\*\*> arrow in the figure in Section  
 358 4) in the same way that the Purge-Jobs operation affects jobs that were submitted to the IPP  
 359 Printer object using IPP, depends on implementation, i.e., on whether the IPP protocol is being  
 360 used as a universal management protocol or just to manage IPP jobs, respectively.

361 Note: if an operator wants to cancel all jobs without clearing out the job history, the operator  
 362 uses the Cancel-Job operation on each job instead of using the Purge-Job operation.

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

365 *Access Rights:* The requesting user must be an operator or administrator of the Printer object.  
 366 Otherwise, the IPP object MUST reject the operation and return: client-error-forbidden, client-  
 367 error-not-authenticated, and client-error-not-authorized as appropriate.

368 **5 Security Considerations**

369 For the job operations in Set 1 (Section 2), the requesting user must either be the submitter of the  
 370 job or an operator or administrator of the Printer object (see [ipp-mod] Section 1). Otherwise,  
 371 the IPP object MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-  
 372 authenticated', or 'client-error-not-authorized' as appropriate. See [ipp-mod] Section 8.3 on the  
 373 two ways that the client MUST specify the user who is performing each IPP operation.

374 For the printer operations in Set 1 (Section 4), the requesting user must by an operator or  
 375 administrator of the Printer object (see [ipp-mod] Section 1). The means for authorizing an  
 376 operator or administrator of the Printer object are not specified in either [ipp-mod] or this  
 377 document.

378 **6 References**

379 [ipp-mod]

380 Isaacson, S., deBry, R., Hastings, T., Herriot, R., Powell, P., "Internet Printing  
381 Protocol/1.0: Model and Semantics" draft-ietf-ipp-mod-10.txt, June, 1998.

382 [ipp-pro]

383 Herriot, R., Butler, S., Moore, P., Tuner, R., "Internet Printing Protocol/1.0: Encoding  
384 and Transport", draft-ietf-ipp-pro-06.txt, June, 1998.

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