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11 Internet Printing Protocol/1.1: Job and Printer Set Operations

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23 Abstract

24 This document specifies 3 additional OPTIONAL operations for use with the Internet Printing Protocol/1.0
25 (IPP) [RFC2565, RFC2566] and IPP/1.1 [ipp-mod, ipp-pro]. The first is the Set-Printer-Attributes
26 operation that operators/administrators may perform on a Printer object to change Printer attribute values.
27 The second is the Set-Job-Attributes operation that end-users may perform on their jobs and
28 operators/administrators may perform on any job, depending on circumstances. The operation changes the
29 Job attribute values. The third is the Get-Printer-Supported-Values operation that operators/administrators
30 may perform on a Printer object in order to determine acceptable values for setting "xxx-supported"
31 attributes using the Set-Printer-Attributes operation.

32 A Printer implementation can make the value of some attributes dependent on the document-format, e.g.
33 "resolution-supported".

34 Two operation attributes: "printer-message-from-operator" (text) and "job-message-from-operator" (text)
35 are included to set the corresponding IPP/1.1 Printer and Job Description attributes with the same names.
36 A new out-of-band value 'any-name' is added. It can be the value of "xxx-supported" attributes whose
37 attribute syntaxes include both 'keyword' and 'name'. The 'any-name' value matches any name supplied by
38 the client during validation.

39 New Printer Description attributes are added:

40 printer-settable-attributes-supported (1setOf type2 keyword)

41 job-settable-attributes-supported (1setOf type2 keyword)

42 printer-message-time (integer(MIN:MAX))

43 printer-message-date-time (dateTime)

44 document-format-varying-attributes (1setOf type2 keyword)

45 A new status code is added: 'client-error-attributes-not-settable'.

46 A 'default' out-of-band values is added for use by the client in Set-Job-Attributes, Job Creation, and
47 Validate-Job requests to indicate explicitly that the Printer is to apply its default value with the same
48 semantics and precedence (lower than the document content) as if the Job attribute were not present on the
49 Job object.

50 Finally, the 'not-settable' out-of-band attribute value is added for returning in the Set-Printer-Attributes and
51 Set-Job-Attributes operation responses.

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

57 This document is intended for registration following the registration procedures of IPP/1.0 [RFC2566] and
58 IPP/1.1 [ipp-mod].

59 The full set of IPP documents includes:

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

66

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

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

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

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

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

88

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149

150 **1 Introduction**

151 The Internet Printing Protocol (IPP) is an application level protocol that can be used for distributed printing
152 using Internet tools and technologies. IPP version 1.1 [ipp-mod, ipp-pro] focuses on end user functionality
153 with a few administrative operations included. This document defines additional OPTIONAL end user,
154 operator, and administrator Set-Job-Attributes and Set-Printer-Attributes operations used to modify Job
155 objects and Printer objects. It also defines a third Get-Printer-Supported-Values operation that returns
156 values that the Printer will accept for setting its "xxx-supported" attributes. The Get-Printer-Supported-
157 Values operation MUST be supported, if the Set-Printer-Attributes operation is supported.

158 This document is a registration proposal for an extension to IPP/1.0 [RFC2565, RFC2566] and IPP/1.1
159 [ipp-mod, ipp-pro] following the registration procedures in those documents.

160 **2 Terminology**

161 This section defines terminology used throughout this document.

162 **2.1 Conformance Terminology**

163 Capitalized terms, such as MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY, NEED
164 NOT, and OPTIONAL, have special meaning relating to conformance. These terms are defined in [ipp-
165 mod] section 12.1 on conformance terminology, most of which is taken from RFC 2119 [RFC2119].

166 The following specialization of these terms apply to this document:

167 REQUIRED: if an implementation supports the extensions described in this document, it MUST
168 support a REQUIRED feature.

169 OPTIONAL: if an implementation supports the extensions described in this document, it MAY support
170 an OPTIONAL feature.

171 **2.2 Other terminology**

172 This document uses terms such as "attributes", "keywords", and "support". These terms have special
173 meaning and are defined in the model terminology [ipp-mod] section 12.2.

174 **3 Requirements and Use Cases**

175 The following requirements and usage are intended to be met by the specification in this document.

176 1. The end-user and the operator need a way to modify a Job that is in the 'pending' or 'pending-held' state.

177 Usage: The end-user discovers that he/she forgot to include a print instruction, such as "finishings" =
 178 'staple' after submitting a job. Rather than canceling the job and resubmitting it to the same Printer, the
 179 end-user is able to modify the job on the Printer.

180 The operator needs to modify a job because it is requesting a particular kind of media for which there is
 181 no more, but the policy is to print the job on a comparable medium.

182 2. The system administrator needs a way to re-configure or change the policy of the IPP Printer remotely.

183 Usage: The system administrator is adding additional media to the supported media list.

184 The system administrator is reducing the capability of the IPP Printer by removing one of the operations
 185 from the supported operations list, such as Cancel-Job, because the policy is to run the IPP Printer like a
 186 public FAX.

187 The system administrator is remotely configuring the Printer after installing it, and so is replacing the
 188 Printer Description attributes that have the out-of-band 'no-value' value (see [ipp-mod] section 4.1) with
 189 the proper values.

190 4 Definition of the Set operations

191 The Set-Printer-Attributes operation (as are all Printer operations) are directed at Printer objects. A client
 192 MUST always supply the "printer-uri" operation attribute in order to identify the correct target of the
 193 operation. These descriptions assume all of the common semantics of IPP/1.1 Model and Semantics
 194 document [ipp-mod] section 3.1.

195 The Set-Job-Attributes operation (as are all Job operations) are directed at Job objects. A client MUST
 196 always supply some means of identifying the Job object in order to identify the correct target of the
 197 operation. That job identification MAY either be a single Job URI or a combination of a Printer URI with a
 198 Job ID as defined in [ipp-mod]. The IPP object implementation MUST support both forms of identification
 199 for every job. If possible, a client SHOULD use the Printer URI with a Job ID rather than a Job URI, since
 200 the 32-bit "job-id" is more readily translated to and from other print protocols that MAY be serving as
 201 gateways into or out of the IPP implementation.

202 The Set Printer operations are summarized in Table 1:

203 **Table 1 - Operation-Id assignments**

Operation Name	Operation-Id	Brief description
Set-Printer-Attributes	0x??	Sets attribute values of the target Printer object
Set-Job-Attributes	0x??	Sets attribute values of the target Job object
Get-Printer-Supported-Values	0x??	Gets values that are valid for setting "xxx-supported" attributes using the Set-Printer-Attributes operation

204 **4.1 Set-Printer-Attributes Operation**

205 This OPTIONAL operation allows a client to set the values of the attributes of a Printer object. In the
206 request, the client supplies the set of Printer attribute names and values that are to be set. In the response,
207 the Printer object returns success or rejects the entire request with indications of which attribute or
208 attributes could not be set.

209 The Printer object validates the client-supplied attributes in the Set-Printer-Attributes request. For an
210 attribute to validate it MUST meet all of the following rules:

- 211 o The Printer MUST support the attribute
- 212 o The attribute MUST NOT be read-only
- 213 o The Printer MUST support the value according to the rules defined in Appendix A

214 If any of the supplied attributes does not validate, the Printer object MUST reject the entire operation; the
215 Printer object MUST NOT partially set some of the supplied attributes. In other words, after the operation,
216 all the supplied attributes MUST be set or none of them MUST be set.

217 The Printer MUST accept this operation in any state, i.e., for any of the values of the Printer object's
218 "printer-state", "printer-state-reasons", and "printer-is-accepting-jobs" attributes, unless explicitly defined
219 otherwise in the definition of the values.

220 This operation MUST NOT change the value of attributes not specified in the operation unless this
221 document explicitly specifies such side-effects, e.g. when the operation sets "printer-message-from-
222 operator", it also sets "printer-message-time" and "printer-message-date-time". In particular, if this
223 operation changes an "xxx-default" attribute, the new value MUST be in the "xxx-supported" attribute or
224 the operation MUST contain a new value for "xxx-supported" which contains the new value for the "xxx-
225 default". Otherwise, the Printer MUST reject the operation.

226 **4.1.1 Settable and READ-ONLY Printer Description attributes**

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

- 228 all Job Template Default ("xxx-default") attributes
- 229 all Job Template Supported ("xxx-supported") attributes
- 230 all Job Template Ready ("xxx-ready") attributes

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

232 Some Printer Description attributes (see [ipp-mod] section 4.4) MUST NOT be settable, i.e., they are
233 READ-ONLY. An attribute marked as "read-only" in the Printer Description attribute table in Appendix A
234 is such an attribute. Printer Description attributes that are not marked as "read-only" MAY be settable
235 using the Set-Printer-Attributes operation, depending on implementation.

236 Note: From now on, all extensions that define new object attributes will indicate whether or not they are
237 READ-ONLY, by including the "READ-ONLY" adjective in their descriptions and/or explicitly stating
238 whether they MAY be settable.

239 If "xxx-supported" Printer Description attribute are settable, then they MUST affect the behavior of the
240 implementation. If they are READ-ONLY then they reflect the implementation and cannot be changed
241 using the Set-Printer-Attributes operation. Consider the following examples:

242 For example, if the "operations-supported" Printer Description attribute (see [ipp-mod] section
243 4.4.15) is settable in a particular implementation, then changing its value with a Set-Printer-
244 Attributes operation MUST affect the operations that the implementation accepts or rejects. Such
245 an implementation will need to be able to reject values for operations that it contains no code
246 support for. If the "operations-supported" Printer Description attribute is not settable in a particular
247 implementation, then that implementation MUST reject an attempt to set it with a Set-Printer-
248 Attributes operation and return the 'client-error-attributes-not-settable' status code (see section 7.1).

249 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must be an
250 operator or administrator of the Printer object (see [ipp-mod] Sections 1 and 8.5).

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

254 **4.1.2 Set-Printer-Attributes Request**

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

256 Group 1: Operation Attributes

257 Natural Language and Character Set:

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

260 Target:

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

263 Requesting User Name:

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

266 "document-format" (mimeMediaType):

267 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute.
268 This attribute is useful for a client to select the document-format to which the attribute modification
269 should be applied. A Printer implementation MAY allow some attributes to have different values
270
271
272

273 for each document format that it supports. See [ipp-mod] section 3.2.5.1 "Get-Printer-Attributes
274 Request".

275
276 If the client includes this attribute, the Printer MUST change the supplied attributes for the
277 document format specified by this attribute. If a supplied attribute is a member of the "document-
278 format-varying-attributes" (i.e., the attribute varies by document format, see section 6.3), the Printer
279 MUST change the supplied attribute for the document format specified by this attribute, but not for
280 other document formats. If a supplied attribute isn't a member of the "document-format-varying-
281 attributes" (i.e. it doesn't vary by document format), the Printer MUST change the supplied attribute
282 for all document formats.

283
284 If the client omits this attribute, the Printer MUST change the supplied attributes for all document
285 formats whether they vary by document-format or not.

286
287 If the client supplies a value for the "document-format" Operation attribute that is either
288 'application/octet-stream' or not supported by the Printer, i.e., is not among the values of the Printer
289 object's "document-format-supported" attribute, the Printer object MUST reject the operation and
290 return the 'client-error-document-format-not-supported' status code. Note: the document-format
291 'application/octet-stream' is the union of several document-formats (see [ipp-mod] section 3.2.5.1,
292 Get-Printer-Attributes) and is not a true document-format.

293

294 Group 2: Printer Attributes

295 The client MUST supply a set of Printer attributes with one or more values (including explicitly
296 allowed out-of-band values) as defined in [ipp-mod] section 4.2 Job Template Attributes ("xxx-
297 default", "xxx-supported", and "xxx-ready" attributes), section 4.4 Printer Description Attributes,
298 and any attribute extensions supported by the Printer. The value(s) of each Printer attribute supplied
299 in Group 2 replaces the value(s) of the corresponding Printer attribute on the target Printer object.
300 For attributes that can have multiple values (1setOf), all values supplied by the client replace all
301 values of the corresponding Printer object attribute. If a Printer object attribute had not been
302 configured yet and so had the 'no-value' out-of-band value (see [ipp-mod] section 4.1), the supplied
303 value(s) replace the 'no-value' value.

304

305 4.1.3 Set-Printer-Attributes Response

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

307 Group 1: Operation Attributes

308 Status Message:

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

312

313 Natural Language and Character Set:

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

316

317 Group 2: Unsupported Attributes

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

319

320 If some of the attributes in the operation fail to validate, the Printer MUST reject the operation,
321 MUST NOT change any Printer attributes, and MUST return the 'client-error-attributes-not-settable'
322 status code. In this group, the Printer MUST also return all attributes that fail to validate. The
323 following are the reasons that an attribute fails to validate and the value returned for the attribute:

324 The Printer doesn't support the attribute: return the attribute with the "out-of-band" value
325 'unsupported' (see [ipp-mod] section 3.1.7 and [ipp-pro]).

326 The attribute is read-only: return the attribute with the "out-of-band" value 'not-settable' (see
327 section 8.1).

328 The Printer doesn't support the value: if the attribute in the operation has a single value
329 return it. If the attribute in the operation is multi-valued, return only those values in a 1setOf
330 that are not supported.

331

332 4.2 Set-Job-Attributes Operation

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

337 This operation is almost identical to the Set-Printer-Attributes operation (see section 4.1). The only
338 differences are that the Set-Job-Attributes operation is directed at a Job object rather than a Printer object,
339 there is no "document-format" operation attribute used when setting a Job object, and the validation is the
340 same as the Job Creation operations (Print-Job, Print-URI, and Create-Job), i.e., depends on the "xxx-
341 supported" Printer Description attributes (see [ipp-mod] section 3.1).

342 The validation of the Set-Job-Attributes request is performed by the Printer as if the job had been submitted
343 originally with the new values and with "ipp-attribute-fidelity" set to 'true', i.e., all modified attributes
344 MUST be supported along with the attributes not modified. If such a Job Creation operation would have
345 been accepted, then the Set-Job-Attributes MUST be accepted. If such a Job Creation operation would
346 have been rejected, then the Set-Job-Attributes MUST be rejected and the Job MUST be unchanged. In
347 addition, if any of the supplied attributes are not supported, are not settable, or the values are not supported,
348 the Printer object MUST reject the entire operation; the Printer object MUST NOT partially set some of the
349 supplied attributes. In other words, after the operation, all the supplied attributes MUST be set or none of
350 them MUST be set.

351 If a client supplies a job attribute in a Set-Job-Attributes request that the Printer supports, and the job was
 352 originally submitted without supplying that attribute, the Printer adds the attribute to the Job object. If the
 353 attribute value is the "out-of-band" value 'default' (see section 8.2), then attribute is changed like any value,
 354 but the Printer treats a Job attribute with the 'default' value as equivalent to the attribute not being present
 355 on the Job, i.e. the Printer uses its defaulting mechanism. As when the Job attribute is not present, the
 356 Printer MUST apply such default mechanism if the document does not contain any corresponding
 357 instruction.

358 The job's current state MUST affect whether the IPP object accepts or rejects the request. In the case where
 359 the operation creates a request for unavailable resources, the Job transitions to a new state. Table 2 shows
 360 the allowed behaviors in each job state and the transitions.

361 **Table 2 - Job State Transition Table for the Set-Job-Attributes operation**

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 implementation, including the attributes being set, whether the job has started marking media, etc.
'processing-stopped'	'processing-stopped'	'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the job has started marking media, etc.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

362

363 This operation MUST NOT change the value of attributes not specified in the operation unless this
 364 document explicitly specifies such side-effects.

365 **4.2.1 Settable and READ-ONLY Job Description attributes**

366 If the Printer supports the "job-message-from-operator" Job Description attribute (see [ipp-mod] section
 367 4.3.16) and the client explicitly supplies a new value for the "job-message-from-operator" in the request,
 368 then the Printer MUST set the "job-message-from-operator" Job attribute to this new value.

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

370 all Job Template job ("xxx") attributes

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

372 Some Job Description attributes (see [ipp-mod] section 4.3) MUST NOT be settable, i.e., they are READ-
373 ONLY. An attribute marked as "read-only" in the Job Description attribute table in Appendix A is such an
374 attribute. The attributes not marked as "read-only" MAY be settable using the Set-Job-Attributes operation,
375 depending on implementation.

376 Note: From now on, all extensions that define new object attributes will indicate whether or not they are
377 READ-ONLY, by including the "READ-ONLY" adjective in their descriptions and/or explicitly stating
378 whether they MAY be settable.

379 *Access Rights:* The authenticated user (see [ipp-mod] section 8.3) performing this operation must either be
380 the job owner (as determined in the Job Creation operation) or an operator or administrator of the Printer
381 object (see [ipp-mod] Sections 1 and 8.5).

382 4.2.2 Set-Job-Attributes Request

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

384 Group 1: Operation Attributes

385 Natural Language and Character Set:

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

388 Target:

389 Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation
390 attribute(s) which define the target for this operation as described in [ipp-mod] section 3.1.5.
391

392 Requesting User Name:

393 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as
394 described in [ipp-mod] section 8.3.
395

396 Group 2: Job Attributes

397
398 The client MUST supply a set of Job attributes with one or more values (including explicitly
399 allowed out-of-band values) as defined in [ipp-mod] section 4.2 Job Template Attributes ("xxx"
400 attributes), section 4.3 Job Description Attributes, and any attribute extensions supported by the
401 Printer. The value(s) of each Job attribute supplied in Group 2 replaces the value(s) of the
402 corresponding Job attribute on the target Job object. For attributes that can have multiple values
403 (1setOf), all values supplied by the client replace all values of the corresponding Job object
404 attribute. If the client supplies an "xxx" attribute with the 'default' out-of-band value (see section
405 8.2), the effect is as if the "xxx" attribute had not been submitted with the job in the Job Creation
406 operation, i.e., the Printer applies its "xxx-default" value if the document content contains no
407 corresponding print instruction. However, the "xxx" attribute is returned in subsequent Get-Job-
408 Attributes and Get-Job responses with the "xxx" attribute with the explicit 'default' out-of-band
409 value (rather than being removed from the Job object).
410

411

412 **4.2.3 Set-Job-Attributes Response**

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

414 Group 1: Operation Attributes

415 Status Message:

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

419

420 Natural Language and Character Set:

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

423

424 Group 2: Unsupported Attributes

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

426

427 If some of the attributes in the operation fail to validate, the Printer MUST reject the operation,
428 MUST NOT change any Job attributes, and MUST return the 'client-error-attributes-not-settable'
429 status code. In this group, the Printer MUST also return all attributes that fail to validate. The
430 following are the reasons that an attribute fails to validate and the value returned for the attribute:

431 The Printer doesn't support the attribute: return the attribute with the "out-of-band" value
432 'unsupported' (see [ipp-mod] section 3.1.7 and [ipp-pro]).

433 The attribute is read-only: return the attribute with the "out-of-band" value 'not-settable' (see
434 section 8.1).

435 The Printer doesn't support the value: if the attribute in the operation has a single value
436 return it. If the attribute in the operation is multi-valued, return only those values in a 1setOf
437 that are not supported.

438 **4.3 Get-Printer-Supported-Values Operation**

439 This OPTIONAL operation allows a client to request the values that the Printer allows in the Set-Printer-
440 Attributes operation for "xxx-supported" attributes. If the Printer supports the Set-Printer-Attributes
441 operation, then it MUST also support this operation. This operation has identical request /response
442 attributes to the Get-Printer-Attributes operation in IPP/1.1 [ipp-mod]. The operation also behaves
443 identically to the Get-Printer-Attributes operation in IPP/1.1 [ipp-mod] with the following exceptions:

- 444 o Get-Printer-Supported-Values supports only "xxx-supported" attributes.

445 o Get-Printer-Attributes returns the current value of specified attributes and Get-Printer-Supported-
446 Values returns values that permit a client to determine what values of "xxx-supported" attributes the
447 Printer supports in the Set-Printer-Operation.

448 o Get-Printer-Supported-Values does not return any 'name' attribute syntax values for any "xxx-
449 supported" attributes. Instead, if the Set-Printer-Attributes operation will accept (any) name value for
450 an "xxx-supported" attribute, then the Get-Printer-Supported-Values operation returns the 'any-value'
451 out-of-band value (see section 8.3) as one of the values of the "xxx-supported" attribute. In other
452 words, the 'any-name' out-of-band value indicates that the Printer implementation supports clients
453 setting 'name' attribute syntax values for "xxx-supported" attributes that are defined with the 'name'
454 attribute syntax as one of their attribute syntaxes.

455 For example, if the Get-Printer-Supported-Values operation returns several keywords as the value of the
456 "media-supported" attribute, then the Set-Printer-Attributes operation MUST accept any of these keywords
457 as values for the "media-supported" attribute. If the Get-Printer-Supported-Values operation returns an
458 'any-name' out-of-band value as one of the values of the "media-supported" attribute, then the Set-Printer-
459 Attributes operation MUST accept any value whose attribute syntax is 'name' as values for the "media-
460 supported" attribute.

461 See Appendix B for a full list of values returned by this operation.

462

463

464 **5 New Operation attributes**

465 This section defines new operation attributes for use with the IPP/1.1 operations indicated. As new
466 operations are defined they will also indicate explicitly whether these operation attributes are defined for
467 use with them.

468 **5.1 "printer-message-from-operator" (text(127))**

469 The Printer SHOULD support this Operation attribute in following operations if it supports the
470 corresponding "printer-message-from-operator" Printer Description attribute.

471 Pause-Printer
472 Resume-Printer
473 Purge-Jobs

474 The client OPTIONALLY supplies this attribute in the above operations. The value of this attribute is a
475 message from the operator about the Printer object on which the operator is performing the operation. If
476 this operation attribute is supported, the Printer copies the value to its "printer-message-from-operator"
477 Printer Description attribute (see [ipp-mod] section 4.4.25) even if this Operation attribute is a zero-length
478 text value or consists solely of white space. In addition, the Printer automatically copies:

- 479 1. the value of its "printer-up-time" attribute (see [ipp-mod] section 4.4.29) to its "printer-message-
480 time" attribute,
- 481 2. the value of its "printer-current-time" (dateTime) attribute (see [ipp-mod] section 4.4.30) to its
482 "printer-message-date-time" attribute, if supported.

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

485 The "printer-message-from-operator" operation attribute MUST NOT be supported as an operation attribute
486 for the Set-Printer-Attributes operation. If the operator wants to set the Printer's "printer-message-from-
487 operator" Printer Description attribute when issuing the Set-Printer-Attributes operation, the client supplies
488 the "printer-message-from-operator" explicitly with its new value as one of the Printer Description
489 attributes in Group 2 in the request. The Printer also updates its "printer-message-time" and "printer-
490 message-date-time" Printer Description attributes. If the client does not explicitly supply the "printer-
491 message-from-operator" with its new value, the Printer leaves the value of the Printer's "printer-message-
492 from-operator" Printer Description attribute unchanged.

493 5.2 "job-message-from-operator" (text(127))

494 The Printer SHOULD support this Operation attribute in following operations if it supports the
495 corresponding "job-message-from-operator" Job Description attribute.

496 Cancel-Job
497 Hold-Job
498 Release-Job
499 Restart-Job

500 The client OPTIONALLY supplies this attribute in the above operations. The value of this attribute is a
501 message from the operator about the Job object on which the operator has just performed an operation. If
502 supported, the Printer copies the value to the Job's "job-message-from-operator" Job Description attribute
503 (see [ipp-mod] section 4.3.16) (even if this Operation attribute is a zero-length text value or consists solely
504 of white space).

505 If the client omits this attribute, the Printer does not change the value of its "job-message-from-operator"
506 Job Description attribute.

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

509 The "job-message-from-operator" operation attribute MUST NOT be supported as an operation attribute for
510 the Set-Job-Attributes operation. If the operator wants to set the Job's "job-message-from-operator" Job
511 Description attribute when issuing the Set-Job-Attributes operation, the client MUST supply the "job-
512 message-from-operator" with its new value as one of the Job Description attributes in Group 2 in the

513 request. Otherwise, the Printer leaves the value of the Job's "job-message-from-operator" Job Description
514 attribute unchanged by not explicitly setting the attribute.

515 **6 New Printer Description Attributes**

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

518 **6.1 printer-settable-attributes-supported (1setOf type2 keyword)**

519 This READ-ONLY Printer attribute identifies the Printer object attributes that are settable in this
520 implementation, i.e., that are settable using the Set-Printer-Attributes operations (see section 4.1). This
521 attribute MUST be supported if the Set-Printer-Attributes operations is supported. The Printer MUST
522 reject attempts to set any Printer attributes that are not one of the values of this attribute, returning the
523 'client-error-attributes-not-settable' status code (see section 7.1). The value of this attribute MAY depend
524 on the value of the "document-format" operation attribute supplied in the Get-Printer-Attributes operation
525 (see [ipp-mod] section 3.2.5.1).

526 Standard keyword values are:

527 'none': There are no settable Printer attributes.

528 'xxx': Where 'xxx' is any of the keyword attribute names allowed by section 4.1.1

529 **6.2 job-settable-attributes-supported (1setOf type2 keyword)**

530 This READ-ONLY Printer attribute identifies the Job object attributes that are settable in this
531 implementation, i.e., that are settable using the Set-Job-Attributes operation (see section 4.2). This attribute
532 MUST be supported if the Set-Job-Attributes operations is supported. The Printer MUST reject attempts to
533 set any Job attributes that are not one of the values of this attribute, returning the 'client-error-attributes-not-
534 settable' status code (see section 7.1).

535 Standard keyword values are:

536 'none': There are no settable Job attributes.

537 'xxx': Where 'xxx' is any of the keyword attribute names allowed by section 4.2.1.

538 **6.3 document-format-varying-attributes (1setOf type2 keyword)**

539 This READ-ONLY Printer Description attribute contains a set of attribute names. This attribute SHOULD
540 be supported by a Printer object, if the Printer object has Printer attributes whose value vary depending on
541 document format (see [ipp-mod] Get-Printer-Attributes operation). This attribute specifies which attribute
542 values can vary by document-format. If an attribute's name "xxx" is a member of this attribute and the
543 value of attribute "xxx" is changed with the Set-Printer-Attributes operation that included the "document-
544 format" operation attribute, then the Printer MUST change the value for the specified document format and

545 no other document formats (see section 4.1.2). If an attribute's name "xxx" is not a member of this attribute
546 and the value of attribute "xxx" is changed with the Set-Printer-Attributes operation, then the attribute is
547 changed for all document formats (whether or not the client supplied the "document-format" operation
548 attribute).

549 **6.4 printer-message-time (integer(MIN:MAX))**

550 This READ-ONLY Printer Description attribute contains the time that the Printer's "printer-message-from-
551 operator" was changed by the operator using any operation where the client supplied the "printer-message-
552 from-operator" operation attribute (see section 5.1) or was explicitly set using the Set-Printer-Attributes
553 operation (see section 4.1). This attribute allows the users to know when the "printer-message-from-
554 operator" attribute was last set.

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

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

561 **6.5 printer-message-date-time (dateTime)**

562 This READ-ONLY Printer Description attribute contains the date and time that the Printer's "printer-
563 message-from-operator" was changed by the operator using any operation where the client supplied the
564 "printer-message-from-operator" operation attribute (see section 5.1) or was explicitly set using the Set-
565 Printer-Attributes operation (see section 4.1). This attribute allows the users to know when the "printer-
566 message-from-operator" attribute was last set.

567 This attribute MUST be supported if the Printer supports both the "printer-message-time" and the "printer-
568 current-time" (dateTime) attributes (see [ipp-mod] section 4.4.30).

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

571 **7 Additional status codes**

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

573 **7.1 'client-error-attributes-not-settable' (0x0413)**

574 If the Set-Printer-Attributes or Set-Job-Attributes operation fails because one of the specified attributes
575 cannot be set for any of the three reasons given in Unsupported Attributes group of sections 4.1.3 and 4.2.3,

576 the Printer MUST return this error code and it MUST return in the Unsupported Attributes Group(see [ipp-
577 mod] section 3.1.7) all of the attributes that could not be set. When the Printer returns this status, it MUST
578 NOT change any of the attributes specified in the operation.

579 **8 Additional out-of-band values**

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

582 **8.1 'not-settable' out-of-band value**

583 The 'not-settable' out-of-band value is used by the IPP Printer in the Unsupported Attributes group of a Set-
584 Job-Attributes or Set-Printer-Attributes response to indicate that an attribute (supplied by the client) is
585 READ-ONLY..

586 The encoding of the out-of-band value is TBD (see [ipp-pro]).

587 **8.2 'default' out-of-band value**

588 The 'default' out-of-band values is used by the client in Set-Job-Attributes, Job Creation (Create-Job, Print-
589 Job, Print-URI), and Validate-Job requests to indicate explicitly that the Printer is to apply its default value
590 with the same semantics and precedence (lower than the document content) as if the Job attribute were not
591 present on the Job object. The semantic effect of the client supplying the 'default' value in a Set-Job-
592 Attributes operation is as if the attribute were to be removed from the Job object. However, if the resulting
593 Job is queried by the Get-Job-Attributes or Get-Jobs operations, the Printer MUST return any attributes
594 with the 'default' value that the client had supplied with the 'default' value, rather than not returning the
595 attributes at all. In other words, the Printer MUST NOT remove any attribute from the Job object for which
596 the client supplies the 'default' out-of-band value. In addition, any attributes that had not been supplied by
597 the client in the Job Creation operation MUST NOT be returned with the 'default' value.

598 The encoding of the out-of-band value is reserved for this purpose (see [ipp-pro]).

599 **8.3 'any-name' out-of-band value**

600 The 'any-name' out-of-band value is used by the IPP Printer as a new value returned by Get-Printer-
601 Supported-Values operation. It is a possible value for an attribute which allows the 'name' attribute syntax.
602 Its presence indicates that the Set-Printer-Attributes operation allows the attribute to have values whose
603 attribute syntax is 'name'.
604

605 The Get-Printer-Supported-Values MAY return the 'any-name' for any of the following IPP/1.1 attributes.

606 media-supported
607 job-hold-until-supported
608

609 job-sheets-supported

610

611 If the value 'any-name' is one of the values of an attribute returned from the Get-Reset-Printer-Attributes,
612 then the Printer MUST allow the Set-Printer-Attributes operation for that attribute to contain any value
613 whose attribute syntax is 'name'. If the value 'any-name' is not one of the values of an attribute returned
614 from the Get-Reset-Printer-Attributes, then the Printer MUST NOT allow the Set-Printer-Attributes
615 operation for that attribute to contain a value whose attribute syntax is 'name'.
616

617

618

618 The encoding of the out-of-band value is TBD (see [ipp-pro]).

619 **9 Conformance Requirements**

620 This section specifies the conformance requirements for clients and IPP objects.

621 Both the Set-Job-Attributes and the Set-Printer-Attributes operations defined in the document are
622 OPTIONAL for an IPP object to support. Either one MAY be supported without the other or both MAY be
623 supported. However, if the Set-Printer-Attributes operation is supported, then the Get-Printer-Supported-
624 Values operation MUST be supported. Otherwise, the Get-Printer-Supported-Values operation is
625 OPTIONAL for an IPP Printer to support.

626 If the Set-Printer-Attributes operation is supported, then the Printer MUST support the following additional
627 items:

- 628 1. the Get-Printer-Supported-Values operation (see section 4.3)
- 629 2. the "printer-settable-attributes-supported" Printer Description attribute (see section 6.1)
- 630 3. the 'not-settable' out-of-band value (see section 8.1)
- 631 4. the 'client-error-not-settable' status code (see section 7.1)
- 632 5. If the 'name' attribute syntax is supported for any "xxx-supported" attribute, then the 'any-name'
633 out-of-band value MUST be supported (see section 8.3)
- 634 6. If "printer-message-from-operator" Printer Description attribute is supported (see [ipp-mod]
635 section 4.4.25), then it MUST be settable.

636 If the Set-Job-Attributes operation is supported, then the Printer MUST support the following additional
637 items:

- 638 1. If the "job-settable-attributes-supported " Printer Description attribute (see section 6.2)
- 639 2. the 'default' out-of-band value (see section 8.2)

- 640 3. If the "job-message-from-operator" Printer Description attribute is supported (see [ipp-mod]
641 4.3.16), then it MUST be settable.

642 It is OPTIONAL for the Printer object to support the "printer-message-time" (integer) and "printer-
643 message-date-time" (dateTime). If both the "printer-message-time" (integer) and the "printer-current-time"
644 (dateTime) (see [ipp-mod] section 4.4.30) Printer Description attributes are supported, then the "printer-
645 message-date-time" (dateTime) attribute MUST be supported.

646 10 IANA Considerations

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

649 <ftp.isi.edu/iana/assignments/ipp/operations/set.txt>

650 11 Internationalization Considerations

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

652 12 Security Considerations

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

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695 **14 References**

696 [ipp-mod]
697 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and
698 Semantics", <draft-ietf-ipp-model-v11-04.txt>, June 23, 1999.

699 [ipp-pro]
700 Herriot, R., Butler, S., Moore, P., Tuner, R., "Internet Printing Protocol/1.1: Encoding and
701 Transport", draft-ietf-ipp-protocol-v11-03.txt, June 23, 1999.

702 [ipp-set2]
703 Kugler, C, Hastings, T., Lewis, H., "Internet Printing Protocol/1.1: Job and Printer Administrative
704 Operations", <draft-ietf-ipp-ops-set2-01.txt>, December 8, 1999.

705 [RFC2565]
706 Herriot, R., Butler, S., Moore, P., Tuner, R., "Internet Printing Protocol/1.0: Encoding and
707 Transport", RFC 2565, April 1999.

708 [RFC2566]
709 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and
710 Semantics", RFC 2566, April 1999.

711 **15 Change History**

712 This section summarizes the changes. Each sub-section is in reverse chronological order. Adding or
713 removing ISSUES that don't change the document are not listed here.

714 **15.1 Changes to the January 20, 2000 version to make the January 30, 2000 version**

715 The following changes to the January 20, 2000 version to make the January 30, 2000 version as a result of
716 the IPP WG telecons and mailing list discussion:

- 717 1. Deleted the "document-format-varying-scope" operation attribute from the Set-Printer-Attributes
718 operation and made whether or not the "document-format" operation was present determine whether
719 one or all document formats are affected, respectively.
- 720 2. Renamed the Get-Reset-Printer-Attributes operation to Get-Printer-Supported-Values, so that it only
721 returns "xxx-supported" values. Relegate obtaining reset values to another operation to be paired with
722 the Reset-Printer operation in the Set2 [ipp-set2] document.
- 723 3. Added "-supported" to the names of the "printer-settable-attributes" and "job-settable-attributes" Printer
724 Description attributes, so that they could be returned in Get-Printer-Supported-Values and could be set
725 by Set-Printer-Attributes.
- 726 4. Deleted "authentication-methods-supported" (1setOf type2 keyword) and "security-methods-supported"
727 (1setOf type2 keyword) and clarified that "uri-authentication-supported" (1setOf type2 keyword) and
728 "uri-security-supported" (1setOf type2 keyword) can return multiple keywords of the same value in a
729 Get-Printer-Supported-Values operation.

730 **15.2 Changes to the January 4, 2000 version to make the January 20, 2000 version**

731 The following changes to the January 4, 2000 version to make the January 4, 2000 version as a result of the
732 IPP WG telecons and mailing list discussion:

- 733 1. Replaced the "factory-settings" operation attribute proposed to be added to the Get-Printer-Attributes
734 operation with the Get-Rest-Printer-Attributes operation which returns the reset values and the possible
735 "xxx-supported" values.
- 736 2. Added the out-of-band 'any-name' value to be used with "xxx-supported" attributes with attribute syntax
737 'type3 keyword | name' to indicate that any name will be accepted in a Job Creation operation for
738 configurations that support such a concept.
- 739 3. Added authentication-methods-supported (1setOf type2 keyword) and security-methods-supported
740 (1setOf type2 keyword) Printer Description attributes so that clients can discover the possible values for
741 use in Set-Printer-Attributes to set "uri-authentication-supported" and "uri-security-supported"
742 attributes, since the Reset-Printer operation doesn't change them.
- 743 4. Added validation rules that the Printer MUST use to validate a Set-Printer-Attributes request.

- 744 5. Clarified that the Set-Printer-Attributes operation MUST NOT have any side effects on other attributes,
745 unless explicitly specified in this document.
- 746 6. Moved the specification of the attributes that MUST be READ-ONLY to Appendix A.
- 747 7. Added the "document-format-varying-attributes" (1setOf type2 keyword)
- 748 8. Added the REQUIRED "document-format-varying-scope" operation attribute to Set-Printer-Attributes
749 in order to control whether one or all document formats are affected for those attributes that vary by
750 document format.
- 751 9. Clarified that the Printer returns the 'client-error-attributes-not-settable' status code in a Set-Printer-
752 Attributes response whether the attribute is READ-ONLY, the attribute is not supported, or the value is
753 not supported.
- 754 10. Added the out-of-band 'default' value for use with Set-Job-Attributes and Job Creation operations.
- 755 11. Deleted the "printer-message-operation" Printer Description attribute.
- 756 12. Made the "Get-Reset-Printer-Attributes" operation, along with the "authentication-methods-supported"
757 and the "security-methods-supported" Printer Description attributes REQUIRED, if the Set-Printer-
758 Attributes operation is supported.
- 759 13. Made the 'not-settable' out-of-band value and the 'client-error-not-settable' status code REQUIRED, if
760 the Set-Printer-Attributes operation is supported.
- 761 14. Made the 'default' out-of-band value REQUIRED, if the Set-Job-Attributes operation is supported.
- 762 15. Removed the requirement that "xxx-supported" Printer Description attributes that contain only one
763 value be read-only.

764 **15.3 Changes to the December 8, 1999 version to make the January 4, 2000 version**

765 The following changes to the December 8, 1999 version to make the January 4, 2000 version as a result of
766 the IPP WG telecons and mailing list discussion:

- 767 1. Removed the Set operations and related items from the Set2 specification [ipp-set2] to create this Set
768 specification.
- 769 2. Added that an attribute that can only be set to one fixed value SHOULD NOT be included in the
770 "printer-settable-attributes" or "job-settable-attributes" attributes.
- 771 3. Indicated that the encoding of the 'not-settable' out-of-band value is TBD.
- 772 4. Added that Set-Job-Attributes operation adds an attribute to the Job object if it wasn't already there
- 773 5. Added the conformance section to make it easy to understand the conformance requirements.

774 **16 Appendix A: Allowed Values for Set-Printer-Attributes**

775 This appendix is a normative part of this document and contains a table of all IPP/1.1 attributes. Each row
776 contains

777 An attribute and

778

779 The values allowed in the Set-Printer-Attributes operation for the attribute. The entry in each cell is
780 the name (first few words) of each item below 1, 2, 3, 4a-g, and 5.

781 The allowed values include the following cases:

- 782 1. Read-only: the Set-Printer-Attributes operation cannot change this attribute
- 783 2. Any of "xxx-supported": the Set-Printer-Attributes operation accepts values that are allowed
784 according to the IPP/1.1 rules for the "xxx-supported" attribute (see section 3.1.2.3 of the "Internet
785 Printing Protocol/1.1: Implementer's Guide" [ipp-iig]). The 'xxx-supported' attribute value is
786 obtained from a 'Get-Printer-Attributes' response.
- 787 3. From Get-Printer-Supported-Values: the Set-Printer-Attributes operation accepts values that are
788 allowed according to the IPP/1.1 rules for the "xxx-supported" attribute (see section 3.1.2.3 of the
789 "Internet Printing Protocol/1.1: Implementer's Guide" [ipp-iig]). The "xxx-supported" attribute value
790 is obtained from a Get-Printer-Supported-Values response (see Appendix B: Attributes returned
791 from Get-Printer-Supported-Values below).
- 792 4. Any value of the proper attribute syntax: the Set-Printer-Attributes accepts any value of the
793 specified attribute syntax. The attribute syntaxes supported are enumerated below.
- 794 a. Any text(127)
- 795 b. Any name(127)
- 796 c. Any uri
- 797 d. Any boolean
- 798 e. Any positive integer
- 799 f. Any dateTime
- 800 g. 1setOf any uri
- 801 5. Combination of 'Any of "xxx-supported"' or 'Any name'.

802 If a Printer implementation doesn't want to allow setting values indicated in this Appendix as "any xxx", it
803 can make the value be read-only. For example, for a monochrome printer the attribute "color-supported" is
804 "false" and MUST be read-only. Otherwise an administrator could set it to "true" because the value can
805 have "any boolean" according to the rules in Table 6 below.

806 **Table 3 - Values allowed for Job Template Attributes in the Set-Job-Attributes Operation**

Job Template Attributes	Values allowed for Set
job-priority (integer(1:100))	Any of "xxx-supported"
job-hold-until (type3 keyword name (MAX))	Any of "xxx-supported"
job-sheets (type3 keyword name(MAX))	Any of "xxx-supported"

Job Template Attributes	Values allowed for Set
multiple-document-handling (type2 keyword)	Any of "xxx-supported"
copies (integer(1:MAX))	Any of "xxx-supported"
finishings (1setOf type2 enum)	Any of "xxx-supported"
page-ranges (1setOf rangeOfInteger (1:MAX))	Any of "xxx-supported"
sides (type2 keyword)	Any of "xxx-supported"
number-up (integer(1:MAX))	Any of "xxx-supported"
orientation-requested (type2 enum)	Any of "xxx-supported"
media (type3 keyword name(MAX))	Any of "xxx-supported"
printer-resolution (resolution)	Any of "xxx-supported"
print-quality (type2 enum)	Any of "xxx-supported"

807

808

Table 4 - Values allowed for Job Description Attributes in the Set-Job-Attributes Operation

Job Description Attributes	Values allowed for Set
job-uri (uri)	Read-only
job-id (integer(1:MAX))	Read-only
job-printer-uri (uri)	Read-only
job-more-info (uri)	Read-only
job-name (name(MAX))	Any name(MAX)
job-originating-user-name (name(MAX))	Read-only
job-state (type1 enum)	Read-only
job-state-reasons (1setOf type2 keyword)	Read-only
job-state-message (text(MAX))	Read-only
job-detailed-status-messages (1setOf text(MAX))	Read-only
job-document-access-errors (1setOf text(MAX))	Read-only
number-of-documents (integer(0:MAX))	Read-only
output-device-assigned (name(127))	Read-only
time-at-creation (integer(MIN:MAX))	Read-only
time-at-processing (integer(MIN:MAX))	Read-only
time-at-completed (integer(MIN:MAX))	Read-only
job-printer-up-time (integer(1:MAX))	Read-only
date-time-at-creation (dateTime)	Read-only
date-time-at-processing (dateTime)	Read-only
date-time-at-completed (dateTime)	Read-only
number-of-intervening-jobs (integer(0:MAX))	Read-only
job-message-from-operator (text(127))	Any text(127)
job-k-octets (integer(0:MAX))	Read-only
job-impressions (integer(0:MAX))	Read-only
job-media-sheets (integer(0:MAX))	Read-only
job-k-octets-processed (integer(0:MAX))	Read-only
job-impressions-completed (integer(0:MAX))	Read-only

Job Description Attributes	Values allowed for Set
job-media-sheets-completed (integer(0:MAX))	Read-only
attributes-charset (charset)	Read-only
attributes-natural-language (naturalLanguage)	Read-only

809

810 **Table 5 - Values allowed for Printer Job Template Attributes in the Set-Printer-Attributes Operation**

Printer Job Template Attributes	Values allowed for Set
job-priority-default (integer(1:100))	Any of "xxx-supported"
job-hold-until-default (type3 keyword name (MAX))	Any of "xxx-supported"
job-sheets-default (type3 keyword name(MAX))	Any of "xxx-supported"
multiple-document-handling-default (type2 keyword)	Any of "xxx-supported"
copies-default (integer(1:MAX))	Any of "xxx-supported"
finishings-default (1setOf type2 enum)	Any of "xxx-supported"
sides-default (type2 keyword)	Any of "xxx-supported"
number-up-default (integer(1:MAX))	Any of "xxx-supported"
orientation-requested-default (type2 enum)	Any of "xxx-supported"
media-default (type3 keyword name(MAX))	Any of "xxx-supported"
printer-resolution-default (resolution)	Any of "xxx-supported"
print-quality-default (type2 enum)	Any of "xxx-supported"
job-priority-supported (integer(1:100))	From Get-Printer-Supported-Values
job-hold-until-supported (1setOf(type3 keyword name (MAX)))	From Get-Printer-Supported-Values
job-sheets-supported (1setOf(type3 keyword name(MAX)))	From Get-Printer-Supported-Values
multiple-document-handling-supported (1setOf type2 keyword)	From Get-Printer-Supported-Values
copies-supported (rangeOfInteger(1:MAX))	From Get-Printer-Supported-Values
finishings-supported (1setOf type2 enum)	From Get-Printer-Supported-Values
page-ranges-supported (boolean)	From Get-Printer-Supported-Values
sides-supported (1setOf type2 keyword)	From Get-Printer-Supported-Values
number-up-supported (1setOf (integer(1:MAX) rangeOfInteger(1:MAX)))	From Get-Printer-Supported-Values
orientation-requested-supported (1setOf type2 enum)	From Get-Printer-Supported-Values
media-supported (1setOf (type3 keyword name(MAX)))	From Get-Printer-Supported-Values
printer-resolution-supported (1setOf resolution)	From Get-Printer-Supported-Values
print-quality-supported (1setOf type2 enum)	From Get-Printer-Supported-Values
media-ready (type3 keyword name(MAX))	From Get-Printer-Supported-Values

811

812 **Table 6 - Values allowed for Printer Description Attributes in the Set-Printer-Attributes Operation**

Printer Description Attributes	Values allowed for Set
printer-uri-supported (1setOf uri)	From Get-Printer-Supported-Values
uri-authentication-supported (1setOf type2 keyword)	From Get-Printer-Supported-Values

Printer Description Attributes	Values allowed for Set
uri-security-supported (1setOf type2 keyword)	From Get-Printer-Supported-Values
printer-name (name(127))	Any name(127)
printer-location (text(127))	Any text(127)
printer-info (text(127))	Any text(127)
printer-more-info (uri)	Any uri
printer-driver-installer (uri)	Any uri
printer-make-and-model (text(127))	Any text(127)
printer-more-info-manufacturer (uri)	Any uri
printer-state (type1 enum)	<i>Read-only</i>
printer-state-reasons (1setOf type2 keyword)	<i>Read-only</i>
printer-state-message (text(MAX))	<i>Read-only</i>
ipp-versions-supported (1setOf type2 keyword)	From Get-Printer-Supported-Values
operations-supported (1setOf type2 enum)	From Get-Printer-Supported-Values
multiple-document-jobs-supported (boolean)	From Get-Printer-Supported-Values
charset-configured (charset)	Any of "xxx-supported"
charset-supported (1setOf charset)	From Get-Printer-Supported-Values
natural-language-configured (naturalLanguage)	Any of "xxx-supported", use generated-natural-language-supported
generated-natural-language-supported (1setOf naturalLanguage)	From Get-Printer-Supported-Values
document-format-default (mimeMediaType)	Any of "xxx-supported"
document-format-supported (1setOf mimeMediaType)	From Get-Printer-Supported-Values
printer-is-accepting-jobs (boolean)	<i>Read-only</i>
queued-job-count (integer(0:MAX))	<i>Read-only</i>
printer-message-from-operator (text(127))	Any text(127)
color-supported (boolean)	From Get-Printer-Supported-Values
reference-uri-schemes-supported (1setOf uriScheme)	From Get-Printer-Supported-Values
pdl-override-supported (type2 keyword)	From Get-Printer-Supported-Values
printer-up-time (integer(1:MAX))	<i>Read-only</i>
printer-current-time (dateTime)	Any dateTime
multiple-operation-time-out (integer(1:MAX))	any positive integer
compression-supported (1setOf type3 keyword)	From Get-Printer-Supported-Values
job-k-octets-supported (rangeOfInteger(0:MAX))	From Get-Printer-Supported-Values
job-impressions-supported (rangeOfInteger(0:MAX))	From Get-Printer-Supported-Values
job-media-sheets-supported (rangeOfInteger(0:MAX))	From Get-Printer-Supported-Values
pages-per-minute (integer(0:MAX))	<i>Read-only</i>
pages-per-minute-color (integer(0:MAX))	<i>Read-only</i>
printer-settable-attributes-supported (1setOf type2 keyword)	From Get-Printer-Supported-Values
job-settable-attributes-supported (1setOf type2 keyword)	From Get-Printer-Supported-Values
document-format-varying-attributes (1setOf type2 keyword)	<i>Read-only</i>
printer-message-time (integer(MIN:MAX))	<i>Read-only</i>

Printer Description Attributes	Values allowed for Set
printer-message-date-time(dateTime)	<i>Read-only</i>

813

814 **17 Appendix B: Attributes returned from Get-Printer-Supported-Values**

815 For the following attributes, the value allowed by the Set-Printer-Attributes operation MUST be a single
816 integer value in the range specified by the value returned by the Get-Printer-Supported-Values operation.

817 **Table 7 - Printer Job Template Attributes returned from Get-Printer-Supported-Values**

Printer Job Template Attributes	Values Returned
job-priority-supported (integer(1:100))	rangeOfInteger(1:100)

818

819 For the following attributes, the value allowed by the Set-Printer-Attributes operation MUST be a single
820 rangeOfInteger value whose bounds do not exceed those of the range specified by the value returned by the
821 Get-Printer-Supported-Values operation.

822 **Table 8 - Printer Job Template Attributes returned from Get-Printer-Supported-Values**

Printer Job Template Attributes	Values Returned
copies-supported (rangeOfInteger(1:MAX))	rangeOfInteger(1:MAX)

823

824 The following table has the same criteria as the last, but is for Printer Description attributes.

825 **Table 9 - Printer Description Attributes returned from Get-Printer-Supported-Values**

Printer Description Attributes	Values allowed for Set
job-k-octets-supported (rangeOfInteger(0:MAX))	rangeOfInteger(0:MAX)
job-impressions-supported (rangeOfInteger(0:MAX))	rangeOfInteger(0:MAX)
job-media-sheets-supported (rangeOfInteger(0:MAX))	rangeOfInteger(0:MAX)

826

827 For the following attributes, the value allowed by the Set-Printer-Attributes operation MUST be one or
828 more integers and rangeOfInteger values, such that the integer values described by these integers and
829 rangeOfInteger is the same as or a subset of the integers described by the integers and rangeOf Integer of
830 value returned by the Get-Printer-Supported-Values operation.

831

Table 10 - Printer Job Template Attributes returned from Get-Printer-Supported-Values

Printer Job Template Attributes	Values Returned
number-up-supported (1setOf (integer(1:MAX) rangeOfInteger(1:MAX)))	1setOf (integer(1:MAX) rangeOfInteger(1:MAX))

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For the following attributes, the value allowed by the Set-Printer-Attributes operation MUST be one or more values, where each such value matches a value returned by the Get-Printer-Supported-Values operation. A keyword, enum, boolean, charset, naturalLanguage, uriScheme, mimeType or resolution value matches if it is equal. A name matches the 'any-name' out-of-band value.

837

Table 11 - Printer Job Template Attributes returned from Get-Printer-Supported-Values

Printer Job Template Attributes	Values Returned
job-hold-until-supported (1setOf(type3 keyword name (MAX)))	1setOf(type3 keyword any name)
job-sheets-supported (1setOf(type3 keyword name(MAX)))	1setOf(type3 keyword any name)
multiple-document-handling-supported (1setOf type2 keyword)	1setOf type2 keyword
finishings-supported (1setOf type2 enum)	1setOf type2 enum
page-ranges-supported (boolean)	1setOf(boolean)
sides-supported (1setOf type2 keyword)	1setOf type2 keyword
orientation-requested-supported (1setOf type2 enum)	1setOf type2 enum
media-supported (1setOf (type3 keyword name(MAX)))	1setOf(type3 keyword any name)
printer-resolution-supported (1setOf resolution)	1setOf resolution
print-quality-supported (1setOf type2 enum)	1setOf type2 enum

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842

The following table has the same criteria as the last, but is for Printer Description attributes. Note that the first two attributes in the table below follow the rules for allowed values in the Set-Printer-Attributes, but unlike other attributes, there can be more than one occurrence of each value because the i-th value of these attributes specifies the authentication or security for the i-th printer in "printer-uri-supported".

843

Table 12 - Printer Description Attributes returned from Get-Printer-Supported-Values

Printer Description Attributes	Values allowed for Set
uri-authentication-supported (1setOf type2 keyword)	1setOf type2 keyword
uri-security-supported (1setOf type2 keyword)	1setOf type2 keyword
ipp-versions-supported (1setOf type2 keyword)	1setOf type2 keyword
operations-supported (1setOf type2 enum)	1setOf type2 keyword
multiple-document-jobs-supported (boolean)	1setOf boolean
charset-supported (1setOf charset)	1setOf charset
generated-natural-language-supported (1setOf naturalLanguage)	1setOf naturalLanguage
document-format-supported (1setOf mimeType)	1setOf mimeType

Printer Description Attributes	Values allowed for Set
color-supported (boolean)	1 setOf boolean
reference-uri-schemes-supported (1setOf uriScheme)	1setOf uriScheme
compression-supported (1setOf type3 keyword)	1setOf type3 keyword
printer-settable-attributes-supported (1setOf type2 keyword)	1setOf type2 keyword
job-settable-attributes-supported (1setOf type2 keyword)	1setOf type2 keyword

844

845 For the following attributes, the value allowed by the Set-Printer-Attributes operation MUST be a single
846 value that matches one of the values returned by the Get-Printer-Supported-Values operation. A keyword,
847 enum, boolean, charset, naturalLanguage, uriScheme, mimeType or resolution value matches if it is
848 equal. A name matches the 'any-name' out-of-band value.

849

850 **Table 13 - Printer Description Attributes returned from Get-Printer-Supported-Values**

Printer Description Attributes	Values allowed for Set
pdl-override-supported (type2 keyword)	1 setOf type2 keyword

851

852 For the following attributes, the Set-Printer-Attributes operation MUST NOT return a value. The IPP
853 Model document [ipp-mod] document specifies the allowed values.

854

855 **Table 14 - Printer Description Attributes returned from Get-Printer-Supported-Values**

Printer Description Attributes	Values allowed for Set
printer-uri-supported (1setOf uri)	any uri

856

857 **18 Appendix C: Full Copyright Statement**

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