<center>Internet Printing Protocol/1.1: Job and Printer Set Operations</center>

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<center>Abstract</center>

This document specifies 23 additional OPTIONAL operations for use with the Internet Printing Protocol/1.0 (IPP) [RFC2565, RFC2566] and IPP/1.1 [ipp-mod, ipp-pro]. These first operations are is the Set-Printer-Attributes operation that operators/administrators may perform on a Printer object to change Printer attribute values. and The second is the Set-Job-Attributes operation that end-users may perform on their jobs and operators/administrators may perform on any job, depending on circumstances. The operation changes the Job attribute values. The third is the Get-Reset-Printer-Attributes operation that operators/administrators may perform on a Printer object in order to determine the values that Printer attributes would have after a Reset operation and to determine acceptable values for certain attributes in the Set-Printer-Attributes operation.

A Printer implementation can make the value of some attributes dependent on the document-format, e.g. The Interpreter object is added for those implementations that make a distinction on the values of some Printer attributes depending on the document-format, such as "resolution-supported".

Two operation attributes: "printer-message-from-operator" (text) and "job-message-from-operator" (text) are included to set the corresponding IPP/1.1 Printer and Job Description attributes with the same names. A "factory-settings" (boolean) operation attribute is added to the Get-Printer-Attributes operation. A new out-

39   of-band value 'any-name' is added. It can be the value of "xxx-supported" attributes whose syntax types
40   includes both 'keyword' and 'name'. The value 'any-name' matches any name supplied by the client during
41   validation.

42   New Printer Description attributes are added:
43   printer-settable-attributes (1setOf type2 keyword)
44   job-settable-attributes (1setOf type2 keyword)
45   printer-message-time (integer(MIN:MAX))
46   printer-message-date-time (dateTime)
47   printer-message-operation (type2 enum)
48   document-format-varying-attributes (1setOf type2 keyword)
49   authentication-methods-supported (1setOf type2 keyword)
50   security-methods-supported (1setOf type2 keyword)

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

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

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

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

63   This document is intended for registration following the registration procedures of IPP/1.0 [RFC2566] and
64   IPP/1.1 [ipp-mod]. This version contains only the Set-Printer-Attributes and Set-Job-Attributes operations
65   which have been removed from the Set2 operation document so that t

66   The full set of IPP documents includes:
67   Design Goals for an Internet Printing Protocol [RFC2567]
68   Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]
69   Internet Printing Protocol/1.1: Model and Semantics (this document)
70   Internet Printing Protocol/1.1: Encoding and Transport [IPP-PRO]
71   Internet Printing Protocol/1.1: Implementer's Guide [IPP-IIG]
72   Mapping between LPD and IPP Protocols [RFC2569]
73

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

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

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

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

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

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148   1   Introduction

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

155   2   Terminology

156   This section defines terminology used throughout this document.

157   2.1   Conformance Terminology

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

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

162   REQUIRED: if an implementation supports the extensions described in this document, it MUST
163   support a REQUIRED feature.
164   OPTIONAL: if an implementation supports the extensions described in this document, it MAY support
165   an OPTIONAL feature.

166   2.2   Other terminology

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

169   **IPP Printer object (or Printer for short) - a software abstraction defined by [ipp-mod].**

170   3   Requirements and Use Cases

171   The following requirements and usage cover only the Set operations.

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

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

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

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

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

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

183   The system administrator is remotely configuring the Printer after installing it, and so is replacing the
184   Printer Description attributes that have the out-of-band 'no-value' value with the proper values.

185   4   Definition of the Set operations

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

190   The Set-Job-Attributes operation (as are all Job operations) are directed at Job objects. A client MUST
191   always supply some means of identifying the Job object in order to identify the correct target of the
192   operation. That job identification MAY either be a single Job URI or a combination of a Printer URI with a
193   Job ID as defined in [ipp-mod]. The IPP object implementation MUST support both forms of identification
194   for every job.

195   The Set Printer operations are summarized in Table 1:

196   **Table 1 - ~~Printer operation~~ 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-Reset-Printer-Attributes	0x??	Gets values that attributes would have after a Reset

197   4.1   Set-Printer-Attributes Operation

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

202   ~~How the~~ The Printer object validates the client-supplied attributes in the Set-Printer-Attributes request ~~is~~
203   ~~implementation-dependent, since there are no corresponding Printer attributes that specify the allowed~~

204 values that may be set on the Printer object. However, if For an attribute to validate it MUST meet all of
205 the following rules:

206   o The Printer MUST support the attribute

207   o The attribute MUST NOT be read-only.

208   o The Printer MUST support the value according to the rules defined in Appendix AB

209 If any of the supplied attributes does not validate, are not supported, are not settable, or the values are not
210 supported, the Printer object MUST reject the entire operation; the Printer object MUST NOT partially set
211 some of the supplied attributes. In other words, after the operation, all the supplied attributes MUST be set
212 or none of them MUST be set.

213 If the Printer supports the "printer-message-from-operator" Printer Description attribute (see [ipp-mod]
214 section 4.4.25) and the client explicitly supplies a new value for the "printer-message-from-operator" in the
215 request, then the Printer MUST set the "printer-message-from-operator" Printer attribute to this new value
216 and MUST also set the "printer-message-time", "printer-message-date-time", and "printer-message-
217 operation" attributes, if supported (see sections 6.3, 6.4, and 6.5).

218 ISSUE 03 - While reviewing the Set-Printer-Attributes operation at the IPP WG meeting, it was suggested
219 that a more general mechanism should be defined for handling and supporting side effects - such as
220 modifying values of any related attributes.

221 The Printer MUST accept this operation in any state, i.e., for any of the values of the Printer object's
222 "printer-state" and "printer-state-reasons" attributes, unless explicitly defined otherwise in the definition of
223 the values.

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

230 4.1.1   Settable and READ-ONLY Printer Description attributes

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

232   all Job Template Default ("xxx-default") attributes
233   all Job Template Supported ("xxx-supported") attributes
234   all Job Template Ready ("xxx-ready") attributes

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

236 The followingSome Printer Description attributes (see [ipp-mod] section 4.4) MUST NOT be settable, i.e.,
237 they are READ-ONLY:. An attribute marked as "read-only" in the Printer Description attribute table in
238 Appendix AB is such an attribute.

239   printer-state
240   printer-state-reasons
241   printer-state-message
242   printer-is-accepting-jobs - see Enable-Printer/Disable-Printer
243   queued-job-count
244   printer-up-time

245   The following Printer Description attributes defined in this document MUST NOT be settable, i.e., they are
246   READ-ONLY:

247   printer-message-time - see Set-Printer-Attributes when setting "printer-message-from-operator"
248   printer-message-date-time - see Set-Printer-Attributes when setting "printer-message-from-operator"
249   printer-message-operation - see Set-Printer-Attributes when setting "printer-message-from-operator"

250   Note: From now on, all extensions that define new object attributes will indicate whether or not they are
251   READ-ONLY, by including the "READ-ONLY" adjective in their descriptions or whether they MAY be
252   settable.

253   The remaining Printer Description attributes that are not READ-ONLY MAY be settable using the Set-
254   Printer-Attributes operation, depending on implementation. If "xxx-supported" Printer Description attribute
255   are settable, then they MUST affect the behavior of the implementation. If they are READ-ONLY then
256   they reflect the implementation and cannot be changed using the Set-Printer-Attributes operation. Consider
257   the following examples:

258   For example, if the "operations-supported" Printer Description attribute (see [ipp-mod] section
259   4.4.15) is settable in a particular implementation, then changing its value with a Set-Printer-
260   Attributes operation MUST affect the operations that the implementation accepts or rejects. Such
261   an implementation will need to be able to reject values for operations that it contains no code
262   support for. If the "operations-supported" Printer Description attribute is not settable in a particular
263   implementation, then that implementation MUST reject an attempt to set it with a Set-Printer-
264   Attributes operation and return the 'client-error-attributes-not-settable' status code (see section 7.1).

265   As another example, if the "ipp-versions-supported" Printer Description attribute (see [ipp-mod]
266   section 4.4.14) is settable in a particular implementation, then changing its value with a Set-Printer-
267   Attributes operation MUST affect the protocol versions that are accepted or rejected. Such an
268   implementation will need to be able to reject values for versions that it contains no code support for.

269   See the "factory-settings" operation attribute (see section 5.3) for a way to query the implementation
270   supported values using the Get-Printer-Attributes operation.

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

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

276   4.1.2   Set-Printer-Attributes Request

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

278   Group 1: Operation Attributes

279   Natural Language and Character Set:
280   The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
281   section 3.1.4.1.
282
283   Target:
284   The "printer-uri" (uri) operation attribute which is the target for this operation as described in [ipp-
285   mod] section 3.1.5.
286
287   Requesting User Name:
288   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as
289   described in [ipp-mod] section 8.3.
290
291   "document-format" (mimeMediaType):
292   The client SHOULD supply this attribute if the value of "document-format-varying-scope " is
293   'single-document-format'. If the value of "document-format-varying-scope " is 'all-document-
294   formats', the Printer ignores this attribute and it SHOULD be omitted. The Printer object MUST
295   support this attribute. This attribute is useful for a client to select the Interpreter objectdocument-
296   format to which the attribute modification should be applied. A Printer implementation MAY allow
297   some attributes to have different values for each document format that it supports. Each Printer
298   object is modeled to contain one or more Interpreter objects. Those Printer attributes whose values
299   vary from Interpreter to Interpreter, are modeled as Interpreter object attributes, while those that do
300   not are Printer object attributes. Thus the target of a Get-Printer-Attributes or Set-Printer-Attributes
301   operation is both the Printer object and the Interpreter object identified by the "document-format"
302   operation attribute supplied by the client. Except for Get-Printer-Attributes and Set-Printer-
303   Attributes, there are no other operations with the Interpreter object as a target. See [ipp-mod]
304   section 3.2.5.1 "Get-Printer-Attributes Request".
305
306   If the client omits this "document-format" operation attribute when the value of "document-format-
307   varying-scope" is 'single-document-format', the Printer object MUST respond as if the attribute had
308   been supplied with the value of the Printer object's "document-format-default" attribute as it would
309   be after the operation. It is recommended that the client always supply a value for "document-
310   format", since the Printer object's "document-format-default" may be 'application/octet-stream', in
311   which case the set attributes and values are for the union of the document formats that the Printer
312   can automatically sense. Additionally, if the operation is setting "document-format-default", the
313   operation must use that value if the "document-format" operation attribute is omitted. For more
314   details, see the description of the 'mimeMediaType' attribute syntax in [ipp-mod] section 4.1.9.
315   ISSUE 01 - MUST the client supply "document-format" when supplying "document-format-
316   varying-scope " with a 'single-document-format' value? If yes, then this paragraph goes away.
317

318 If a client wants to set an attribute for all of the Interpreter objects to the same value, it can query the
319 Printer's "document-format-supported" Printer Description attribute and perform separate Set-
320 Printer-Attributes for each document format supported.
321

322 If the Printer object does not distinguish between different sets of supported values for each
323 different document format when validating jobs in the create and Validate-Job operations (the same
324 rule as for Get-Printer-Attributes), it MUST NOT distinguish between different document formats
325 in the Set-Printer-Attributes operation. If the Printer object does distinguish between different sets
326 of supported values for each different document format specified by the client, this specialization
327 applies only to the same Printer attributes as the Get-Printer-Attributes operation (see [ipp-mod]
328 section 3.2.5.1).
329

330 If the client supplies a value for the "document-format" Operation attribute that is not supported by
331 the Printer, i.e., is not among the values of the Printer object's "document-format-supported"
332 attribute, the Printer object MUST reject the operation and return the 'client-error-document-format-
333 not-supported' status code.
334

335 "document-format-varying-scope " (type2 keyword):
336 The client MUST supply this attribute. The Printer object MUST support this attribute. This
337 attribute specifies whether the operation changes the value for all document formats or just the one
338 that the client supplies in "document-format". The supported value of this attribute are:
339

340 'all-document-formats': The operation changes the specifiedsupplied attributes for all document
341 formats whether they vary by document-format or not. The value of the "document-format"
342 operation attribute, if present, is ignored.
343 'single-document-format': The operation changes the specified attributes for the document
344 format specified by the "document-format" attribute. If an attribute varies by document
345 format, it is changed for the specified document format, but not for other document formats.
346 If an attribute doesn't vary by document format, it is changed for all document formats.
347
348

349 Group 2: Printer Attributes

350 The client MUST supply a set of Printer attributes as defined in [ipp-mod] section 4.2 Job Template
351 Attributes ("xxx-default", "xxx-supported", and "xxx-ready" attributes), section 4.4 Printer
352 Description Attributes, and any attribute extensions supported by the Printer. Each Printer attribute
353 supplied in Group 2 replaces the value(s) of the corresponding Printer attribute on the target Printer
354 object. For attributes that can have multiple values (1setOf), all values supplied by the client
355 replace all values of the corresponding Printer object attribute. If a Printer object attribute had not
356 been configured yet and so had the 'no-value' out-of-band value (see [ipp-mod] 4.1), the supplied
357 value(s) replace the 'no-value' value.
358

359   4.1.3   Set-Printer-Attributes Response

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

361   Group 1: Operation Attributes

362   Status Message:
363   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY
364   includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation
365   attribute as described in [ipp-mod] sections 13 and 3.1.6.
366
367   Natural Language and Character Set:
368   The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
369   section 3.1.4.2.
370

371   Group 2: Unsupported Attributes

372   See [ipp-mod] section 3.1.7 for details on returning Unsupported Attributes.
373
374   If some of the attributes in the operation fail to validate, the Printer MUST reject the operation, and
375   return the 'client-error-attributes-not-settable' status code. The Printer MUST also return all
376   attributes that fail to validate in this group. The following are the reasons that an attribute fails to
377   validate and the value returned for the attribute.

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

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

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

385
386
387   If all the client-supplied attributes are supported, but one or more are not settable by the
388   implementation, i.e., are not among the values of the Printer's "printer-settable-attributes" Printer
389   Description attribute (see section 6.1), the Printer object MUST reject the operation, return the
390   'client-error-attributes-not-settable' status code, and return the client-supplied attribute(s) with a
391   substituted out-of-band value of 'not-settable' (see section 8.1). This value's syntax type is "out-of-
392   band" and its encoding is defined by special rules for "out-of-band" values in the "Encoding and
393   Transport" document [IPP-PRO]. Its value indicates that the attribute is supported, but is not
394   settable.
395

396   4.2   Set-Job-Attributes Operation

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

400   This operation is almost identical to the Set-Printer-Attributes operation (see section 0). The only
401   differences are that the Set-Job-Attributes operation is directed at a Job object rather than a Printer object,
402   there is no "document-format" operation attribute used when setting a Job object, and the validation is the
403   same as the create job operations, i.e., depends on the "xxx-supported" Printer Description attributes.

404   The validation of the Set-Job-Attributes request is performed as if the job had been submitted originally
405   with the new values and with "ipp-attribute-fidelity" set to 'true', i.e., all modified attributes MUST be
406   supported along with the attributes not modified. If such a create job operation would have been accepted,
407   then the Set-Job-Attributes MUST be accepted. If such a create job operation would have been rejected,
408   then the Set-Job-Attributes MUST be rejected and the Job MUST be unchanged.   In addition, if any of the
409   supplied attributes are not supported, are not settable, or the values are not supported, the Printer object
410   MUST reject the entire operation; the Printer object MUST NOT partially set some of the supplied
411   attributes. In other words, after the operation, all the supplied attributes MUST be set or none of them
412   MUST be set.

413   If a client supplies a job attribute in a Set-Job-Attributes request that the Printer supports, and the job was
414   originally submitted without supplying that attribute, the Printer adds the attribute to the Job object. If the
415   attribute value is the "out-of-band" value 'default' (see section 8.3), then attribute is changed like any value,
416   but the Printer treats a Job attribute with the 'default' value as equivalent to the attribute not being present
417   on the Job, i.e. the Printer uses its defaulting mechanism. As when the Job attribute is not present, the
418   Printer MUST apply such default mechanism if the document does not contain any corresponding
419   instruction.

420   ISSUE 04 - How does a client indicate in a Set-Job-Attributes operatio

421   n that a Job attribute is to be removed from the Job object? At the IPP WG meeting, there was general
422   agreement that the protocol should support the ability to "unset" values.

423   ISSUE 05 - There is no need to be able to remove a particular attribute value from a (multi-valued)
424   attribute, is there?

425   ISSUE 06 - Removing an attribute from a Printer is not needed, correct?

426   ISSUE 07 - Is it OK that Set-Job-Attributes validates independently from how the "ipp-attribute-fidelity"
427   operation attribute had been supplied in the Job Creation operation? Its not currently stored with the Job
428   object.

429   ISSUE 08 - For simplicity, is it OK that we don't have an "ipp-attribute-fidelity" operation attribute for the
430   Set-Job-Attributes operation, so that the behavior is as if it were supplied with the 'true' value?

431 The job's current state MUST affect whether tThe IPP object MUST accepts or rejects the request. based on
432 the job's current state and In the case where the operation creates a request for unavailable resources, the
433 Job transitions to a new state. transition the job to the indicated new state The table below shows the
434 allowed behaviors in each job state and the transitions. as follows:

Current "job-state"	New "job-state"	IPP object's response status code and action:
'pending'	'pending'	'successful-ok'
'pending'	'pending-held'	'successful-ok' - needed resources are not ready
'pending-held'	'pending-held'	'successful-ok'
'pending-held'	'pending'	'successful-ok' - needed resources are ready
'processing'	'processing'	'successful-ok' or 'client-error-not-possible' depending on 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 implemenationimplementation, 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'

435

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

438 4.2.1   Settable and READ-ONLY Job Description attributes

439 If the Printer supports the "job-message-from-operator" Job Description attribute (see [ipp-mod] section
440 4.3.16) and the client explicitly supplies a new value for the "job-message-from-operator" in the request,
441 then the Printer MUST set the "job-message-from-operator" Job attribute to this new value.

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

443   all Job Template job ("xxx") attributes (see [ipp-mod] section 4.2 and extensions)

444 that the implementation supports.

445 The followingSome Job Description attributes (see [ipp-mod] section 4.3) MUST NOT be settable, i.e.,
446 they are READ-ONLY.: An attribute marked as "read-only" in the Job Description attribute table in
447 Appendix AB is such an attribute. The attributes not marked as "read-only" MAY be settable using the Set-
448 Job-Attributes operation, depending on implementation.

449

450   ~~job-uri~~
451   ~~job-id~~
452   ~~job-printer-uri~~
453   ~~job-more-info~~
454   ~~job-originating-user-name - set in create operation~~
455   ~~job-state~~
456   ~~job-state-reasons~~
457   ~~job-state-message~~
458   ~~number-of-documents~~
459   ~~output-device-assigned~~
460   ~~time-at-creation~~
461   ~~time-at-processing~~
462   ~~time-at-completed~~
463   ~~job-printer-up-time~~
464   ~~date-time-at-creation~~
465   ~~date-time-at-processing~~
466   ~~date-time-at-completed~~
467   ~~number-of-intervening-jobs~~
468   ~~job-k-octets~~
469   ~~job-k-octets-processed~~
470   ~~job-impressions-completed~~
471   ~~job-media-sheets-completed~~
472   ~~attributes-charset - set in Job Creation operation~~
473   ~~attributes-natural-language - set in Job Creation operation~~

474   ~~The remaining Job Description attributes MAY be settable using the Set-Job-Attributes operation,~~
475   ~~depending on implementation.~~

476   Note: From now on, all extensions that define new object attributes will indicate whether or not they are
477   READ-ONLY, by including the "READ-ONLY" adjective in their descriptions. If "READ-ONLY" is
478   omitted, it is assumed that the attribute MAY be settable by the appropriate Set-Xxx operation.

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

482   4.2.2   Set-Job-Attributes Request

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

484   Group 1: Operation Attributes

485   Natural Language and Character Set:
486   The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
487   section 3.1.4.1.
488
489   Target:
490   Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation
491   attribute(s) which define the target for this operation as described in [ipp-mod] section 3.1.5.
492

493   Requesting User Name:
494   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as
495   described in [ipp-mod] section 8.3.
496
497

498   Group 2: Job Attributes

499   The client MUST supply a set of Job attributes as defined in [ipp-mod] section 4.2 Job Template
500   Attributes ("xxx" attributes), section 4.3 Job Description Attributes, and any attribute extensions
501   supported by the Printer. Each Job attribute supplied in Group 2 replaces the value(s) of the
502   corresponding Job attribute on the target Job object. For attributes that can have multiple values
503   (1setOf), all values supplied by the client replace all values of the corresponding Job object
504   attribute.
505

506   4.2.3   Set-Job-Attributes Response

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

508   Group 1: Operation Attributes

509   Status Message:
510   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY
511   includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation
512   attribute as described in [ipp-mod] sections 13 and 3.1.6.
513
514   Natural Language and Character Set:
515   The "attributes-charset" and "attributes-natural-language" attributes as described in [ipp-mod]
516   section 3.1.4.2.
517

518   Group 2: Unsupported Attributes

519   See [ipp-mod] section 3.1.7 for details on returning Unsupported Attributes.
520
521   If some of the attributes in the operation fail to validate, the Printer MUST reject the operation, and
522   return the 'client-error-attributes-not-settable' status code. The Printer MUST also return all
523   attributes that fail to validate in this group. The following are the reasons that an attribute fails to
524   validate and the value returned for the attribute.

525   The Printer doesn't support the attribute: return the attribute with the "out-of-band" value
526   'unsupported' (see [ipp-pro]).

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

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

532 If all the client-supplied attributes are supported, but one or more are not settable by the
533 implementation, i.e., are not among the values of the Printer's "job-settable-attributes" Printer
534 Description attribute (see section 6.1), the Printer object MUST reject the operation, return the
535 'client-error-attributes-not-settable' status code, and return the client-supplied attribute(s) with a
536 substituted out-of-band value of 'not-settable' (see section 8.1). This value's syntax type is "out-of-
537 band" and its encoding is defined by special rules for "out-of-band" values in the "Encoding and
538 Transport" document [IPP-PRO]. Its value indicates that the attribute is supported, but is not
539 settable.

540 ## 4.3   Get-Reset-Printer-Attributes Operation

541 This OPTIONAL operation allows a client to request the values of the attributes of a Printer object as they
542 would be after a Reset operation. If the Printer supports the Set-Printer-Attributes operation, then it MUST
543 also support this operation. This operation has identical request /response attributes to the 'Get-Printer-
544 Attributes' operation in IPP/1.1 [ipp-mod]. The operation also behaves identically to the 'Get-Printer-
545 Attributes' operation in IPP/1.1 [ipp-mod] except for:

546 o 'Get-Printer-Attributes' returns the current value of specified attributes and 'Get-Reset-Printer-
547 Attributes' returns the value that 'Get-Printer-Attributes' would return after a "Reset" operation. The
548 "Reset" operation MAY be a Reset-Printer operation (see [ipp-set2]) or a reset performed locally to the
549 Printer.

550 o 'Get-Reset-Printer-Attributes' does not return attributes the Printer leaves unchanged during a Reset
551 operation. The attributes that are not returned are:

552 printer-uri-supported
553 printer-name
554 printer-location
555 printer-info
556 printer-state
557 printer-state-reasons
558 printer-state-message
559 printer-is-accepting-jobs
560 queued-job-count
561 printer-up-time
562 printer-current-time

564 A client can determine the allowed values for "xxx-supported" attributes in the Set-Printer-Attributes
565 operation by retrieving the value of "xxx-supported" with the Get-Reset-Printer-Attributes operation.

567 ISSUE 02: There could be a separate operation Get-Allowed-Printer-Attributes for determining allowed
568 values. This operation would return the same value as Get-Reset-Printer-Attributes for "xxx-supported", but

569 would return allowed values rather than the Reset value for other attributes. We have not yet seen a need
570 for such an operation because the spec provides rules for inferring the allowed values except for "xxx-
571 supported" values.

572 5 New objects and new relationships of existing objects

573 This section defines the new Interpreter object.

574 1.1 Interpreter object

575 The Interpreter object models the document format interpreters that are contained in the Printer object. The
576 purpose of the Interpreter object is to model those Printer attributes whose value depends on which
577 interpreter is being used to process the document. Depending on implementation, the Printer object
578 attributes whose values ("xxx-supported" and "xxx-default") depend on the interpreter, i.e., on the
579 "document-format" of the document being processed, are considered to be Interpreter object attributes
580 instead. A Get-Printer-Attributes operation returns Printer and Interpreter attributes as specified in the
581 "requested-attributes" operation attribute supplied by the client. Depending on the value of the "document-
582 format" attribute supplied by the client in the Get-Printer-Attributes request (or the "document-format-
583 default", if the client omits the "document-format" attribute), selects the corresponding Interpreter object.

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

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

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

601 ISSUE 01 - Is there a better way to model the Printer attributes that depend on the interpreter (that is still
602 compatible with IPP/1.1)? It should be clear to the operator whether the Set-Printer-Attributes operation is
603 affecting all interpreters or just the one specified by the "document-format" operation attribute (or its
604 default)? There have been suggestions to have "xxx-exceptions" (collection) Printer Description attributes

where "xxx" is the document-format that indicate for each interpreter explicitly which Printer attributes are specialized for it. For example: "application-postscript-exceptions" (collection) and "application-vnd-hp-pcl-exceptions (collection). Or have a "set-all-interpreters" (boolean) Set-Printer-Attributes operation attribute that sets all interpreters.

Note: The interaction of the Set operations and fan-out and fan-in will be defined in the Set2 document, rather than this document.

5   New Operation attributes

This section defines new operation attributes for use with the IPP/1.1 and the Set operations as shown in Table 1..

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

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

     Pause-Printer
     Resume-Printer
     Purge-Jobs

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

1. the value of its "printer-up-time" attribute (see [ipp-mod] section 4.4.29) to its "printer-message-time" attribute,

2. the value of its printer-current-time" (dateTime) attribute (see [ipp-mod] section 4.4.30) to its "printer-message-date-time" attribute, if supported, and

3.the value of the operation-id value of this operation (see [ipp-mod] section 4.4.15) to its "printer-message-operation" attribute.

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

636 If the client supplies this attribute with a zero-length text value or with a value consisting solely of white
637 space, the Printer copies that value as any other value to the Printer's "printer-message-from-operator" and
638 sets the "printer-message-time", "printer-message-date-time", and "printer-message-operation" attributes.
639 Supplying such a value is the way that the operator indicates that there is no longer a printer message from
640 the operator (rather than using the "out-of-band" 'no-value' value).

641 The "printer-message-from-operator" operation attribute MUST NOT be supported as an operation attribute
642 for the Set-Printer-Attributes operation. If the operator wants to set the Printer's "printer-message-from-
643 operator" Printer Description attribute when issuing the Set-Printer-Attributes operation, the client supplies
644 the "printer-message-from-operator" explicitly with its new value as one of the Printer Description
645 attributes in Group 2 in the request. The Printer also updates its "printer-message-time", and "printer-
646 message-date-time", and "printer-message-operation" Printer Description attributes. If the client does not
647 explicitly supply the "printer-message-from-operator" with its new value, the Printer leaves the value of the
648 Printer's "printer-message-from-operator" Printer Description attribute unchanged.

649 5.2   "job-message-from-operator" (text(127))

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

652   Cancel-Job
653   Hold-Job
654   Release-Job
655   Restart-Job

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

662 If the client omits this attribute, the Printer does not change the value of its "printerjob-message-from-
663 operator" Job Description attribute.

664 If the client supplies this attribute with a zero-length text value or with a value consisting solely of white
665 space, the Printer copies that value as any other value to the job's "job-message-from-operator". Supplying
666 such a value is the way that the operator indicates that there is no longer a job message from the operator
667 (rather than using the "out-of-band" 'no-value' value).

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

670 The "job-message-from-operator" operation attribute MUST NOT be supported as an operation attribute for
671 the Set-Job-Attributes operation. If the operator wants to set the Job's "job-message-from-operator" Job

672 Description attribute when issuing the Set-Job-Attributes operation, the client MUST supplyies the "job-
673 message-from-operator" with its new value as one of the Job Description attributes in Group 2 in the
674 request. Otherwise, the Printer leaves the value of the Job's "job-message-from-operator" Job Description
675 attribute unchanged by not explicitly setting the attribute.

676 6.3 "factory-settings" (boolean) - new operation attribute for Get-Printer-Attributes:

677 The client OPTIONALLY supplies this attribute. The Printer object OPTIONALLY supports this attribute,
678 if it supports the Set-Printer-Attributes operation. If the client omits this attribute or supplies the 'false'
679 value, the Printer returns the current values of the requested attributes that are settable, i.e., the values that
680 have been set by previous Set-Printer-Attributes. If the client supplies the 'true' value, the Printer returns
681 the factory settings, i.e., the inherent values supported by the implementation as shipped from the
682 manufacturer or established at install time. This operation attribute allows an operator to determine which
683 values are supported in an implementation after having modified a settable attribute. Attributes that are not
684 settable are not affected by this operation attribute, so that the Printer returns the same values for non-
685 settable attribute when either the 'true' or 'false' value has been supplied. If this operation attribute is
686 supported, both 'true' and 'false' values MUST be supported.

687 ISSUE 02 - Should the attribute names be modified (e.g., with a unique suffix) to identify them as "factory
688 defaults"? At the IPP WG meeting, some individuals thought that this would make some of the factory
689 default handling easier to specify/implement. Also, some of the attributes could be prefixed/suffixed to
690 indicate that they are [only] applicable to specific document formats. Although preliminary discussion
691 appears encouraging, the topic was deferred for more detailed examination.

692 7 6   New Printer Description Attributes

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

695 1.1 6.1   printer-settable-attributes (1setOf type2 keyword)

696 This READ-ONLY Printer attribute identifies the Printer object attributes that are settable in this
697 implementation, i.e., that are settable using the Set-Printer-Attributes operations (see section 0). This
698 attribute MUST be supported if the Set-Printer-Attributes operations is supported. The Printer MUST
699 reject attempts to set any Printer attributes that are not one of the values of this attribute, returning the
700 'client-error-attributes-not-settable' status code (see section 7.1). The value of this attribute MAY depend
701 on the value of the "document-format" operation attribute supplied in the Get-Printer-Attributes operation
702 (see [ipp-mod] section 3.2.5.1).

703 For a Printer attribute that is normally settable, if a Printer object only supports a single fixed value for that
704 attribute, it SHOULD NOT include that attribute's keyword name in this attribute's value. For example, if a
705 Printer only supports "sides" with a 'one-sided' value, then the "sides-supported" keyword SHOULD NOT
706 be one of the values of its "printer-settable-attributes" attribute.

707   Standard keyword values are:

708   'none': There are no settable Printer attributes.
709   'xxx':   Where 'xxx' is any of the keyword attribute names allowed by section 4.1.1

710   7.26.2   job-settable-attributes (1setOf type2 keyword)

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

716   For a Job attribute that is normally settable, if a Printer object only supports a single fixed value for that
717   attribute, it SHOULD NOT include that attribute's keyword name in this attribute's value. For example, if a
718   Printer only supports "sides" with a 'one-sided' value, then the "sides" keyword SHOULD NOT be one of
719   the values of its "job-settable-attributes" attribute.

720   Standard keyword values are:

721   'none': There are no settable Job attributes.
722   'xxx':   Where 'xxx' is any of the keyword attribute names allowed by section 4.2.1.

723   7.36.3   printer-message-time (integer(MIN:MAX))

724   This READ-ONLY Printer Description attribute contains the time that the Printer's "printer-message-from-
725   operator" was changed by the operator using any operation where the client supplied the "printer-message-
726   from-operator" operation attribute (see section 5.1) or was explicitly set using the Set-Printer-Attributes
727   operation (see section 0). This attribute allows the users to know when the "printer-message-from-
728   operator" attribute was last set.

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

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

735   "document-format-varying-attributes" (1setOf type2 keyword) to list those
736   Printer attributes ("xxx-supported", "xxx-default", etc) that can vary for
737   different document formats.

738   7.46.4   printer-message-date-time (dateTime)

739   This READ-ONLY Printer Description attribute contains the date and time that the Printer's "printer-
740   message-from-operator" was changed by the operator using any operation where the client supplied the

741 "printer-message-from-operator" operation attribute (see section 5.1) or was explicitly set using the Set-
742 Printer-Attributes operation (see section 0). This attribute allows the users to know when the "printer-
743 message-from-operator" attribute was last set.

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

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

748 7.5printer-message-operation (type2 enum)

749 This READ-ONLY Printer Description attribute identifies the operation that was used to change the
750 Printer's "printer-message-from-operator" by the operator using any operation where the client supplied the
751 "printer-message-from-operator" operation attribute (see section 5.1) or explicitly set using the Set-Printer-
752 Attributes operation (see section 9.1). This attribute allows the users to know which operation was used to
753 change the "printer-message-from-operator" attribute when it was last set.

754 The standard enum values are those defined for the "operations-supported" Printer Description attribute (see
755 [ipp-mod] section 4.4.15).

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

757 6.5   document-format-varying-attributes (1setOf type2 keyword)

758 This READ-ONLY Printer Description attribute contains a set of attribute names. This attribute SHOULD
759 be supported by a Printer object, if the Printer object has Printer attributes whose value vary depending on
760 document format (see [ipp-mod] Get-Printer-Attributes operation). This attribute specifies which attribute
761 values can vary by document-format. If an attribute's name is a member of this attribute and its value is
762 changed with the Set-Printer-Attributes operation and the Operation attribute "document-format-varying-
763 scope " has the value 'single-document-format', then the Printer MUST change the value for the specified
764 document format and no other document formats. If an attribute's name is not a member of this attribute
765 and its value is changed with the Set-Printer-Attributes operation and the Operation attribute "document-
766 format-varying-scope " has the value 'single-document-format', then the attribute is changed for all
767 document formats.

768 6.6   authentication-methods-supported (1setOf type2 keyword)

769 This Printer Description attribute contains a set of authentication methods supported by the Printer. This
770 attribute specifies the allowed values of the "uri-authentication-supported" Printer Description attribute.

771 This attribute MUST be supported if the Printer allows the Set-Printer-Attributes operation to set the "uri-
772 authentication-supported" attribute.

773   6.7   security-methods-supported (1setOf type2 keyword)

774   This Printer Description attribute contains a set of authentication methods supported by the Printer. This
775   attribute specifies the allowed values of the "uri-security-supported" Printer Description attribute.

776   This attribute MUST be supported if the Printer allows the Set-Printer-Attributes operation to set the "uri-
777   security-supported attribute".

778   87   Additional status codes

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

780   1.17.1   'client-error-attributes-not-settable' (0x0413)

781   If the In a Set-Printer-Attributes or Set-Job-Attributes operation fails because one of the specified attributes
782   cannot be set for any of the three reasons given in Unsupported Attributes group of sections 4.1.3 and 4.2.3,
783   the Printer MUST return this error code and it MUST return in the Unsupported Attributes Group(see [ipp-
784   mod] section 3.1.7) all of the attributes that could not be set. When the Printer returns this status, it MUST
785   NOT change any of the attributes specified in the operation. request, if all the client-supplied attributes are
786   supported, but the Printer object does not support one or more attributes as settable, the Printer object
787   MUST return this status code. The Printer object MUST also return in the Unsupported Attributes Group
788   (see [ipp-mod] section 3.1.7) all the attributes supplied by the client that are not settable with the values
789   changed to the out-of-band 'not-settable' value (see section 8.1). For example, if the request indicates 'job-
790   state', all implementations MUST reject the request. As another example, if the request indicates an
791   attribute that is supported, but not settable by this implementation, such as, say, "printer-name", the
792   implementation rejects the request.

793   8   Additional out-of-band values

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

796   1.18.1   'not-settable' out of out-of-band value

797   The 'not-settable' out-of-out of-band value is used by the IPP Printer in the Unsupported Attributes group of
798   a Set-Job-Attributes or Set-Printer-Attributes response to indicate that an attribute that was (supplied by the
799   client), is supported but is defined to be a READ-ONLY. attribute, is not settable in that implementation or
800   as defined by the policy for that system, because it is not in the "job-settable-attributes" or "printer-settable-
801   attributes" Printer Description attributes, respectively.

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

803   8.2   'any-name' out-of-band value

804   The 'any-name' out-of-band value is used by the IPP Printer as a new value allowed in "xxx-supported"
805   supported attributes which allow the 'name' syntax type.

806

807   To supported this value, the syntax type of the following three attributes is changed from "1setOf type3
808   keyword | name (MAX))" to "1setOf type3 keyword | name (MAX)) | any-name":

809

810   media-supported
811   job-hold-until-supported
812   job-sheets-supported

813

814   If the value 'any-name' is one of the values of an attribute returned from the Get-Reset-Printer-Attributes,
815   then the Printer MUST allow the Set-Printer-Attributes operation for that attribute to contain the 'any-name'
816   value or a name value. If the value 'any-name' is not one of the values of an attribute returned from the Get-
817   Reset-Printer-Attributes, then the Printer MUST NOT allow the Set-Printer-Attributes operation for that
818   attribute to contain the 'any-name' value or a name value.

819

820   Furthermore, if any of the above three attributes has the 'any-name' value or any name values,. the Reset
821   operation MUST not remove them.

822

823   If the value 'any-name' is one of the values of an attribute returned from the Get-Printer-Attributes, then the
824   Printer MUST validate any name value for that attribute. If the job is accepted, it is put into the pending-
825   held state. If the value 'any-name' is not one of the values of an attribute returned from the Get-Printer-
826   Attributes, then the Printer MUST NOT validate a name value for that attribute unless the name is
827   explicitly is in the corresponding "xxx-supported" attribute.

828

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

830   ISSUE 03: Should the 'any-name' value be a keyword with special behavior or a new type of value, such as
831   an out-of-band value? This document has been written as an out-of-band value.

832   8.3   'default' out-of-band value

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

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

844   9   Conformance Requirements

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

846   Both the Set-Job-Attributes and the Set-Printer-Attributes operations defined in the document are
847   OPTIONAL for an IPP object to support. Either one MAY be supported without the other or both MAY be
848   supported.

849   Get-Reset-Printer-Attributes operation is OPTIONAL for an IPP object to support.

850   If the Set-Printer-Attributes operation is supported, then the "printer-settable-attributes" Printer Description
851   attribute and Get-Reset-Printer-Attributes operation MUST be supported. Otherwise, the Get-Reset-
852   Printer-Attributes operation is OPTIONAL for an IPP Printer to support.

853   If the Set-Printer-Attributes operation is supported, then the 'not-settable' out-of-band value and the 'client-
854   error-not-settable' status code MUST be supported.

855   If the Set-Printer-Attributes operation is supported and the Printer allows the Set-Printer-Attributes
856   operation to set the "uri-authentication-supported" Printer Description attribute, then the Printer MUST also
857   support the "security-methods-supported" Printer Description attribute.

858   If the Set-Printer-Attributes operation is supported and the Printer allows the Set-Printer-Attributes
859   operation to set the "uri-security-supported attribute" Printer Description attribute, then the Printer MUST
860   also support the "security-methods-supported" Printer Description attribute.

861   If the Set-Printer-Attributes operation is supported and the name syntax type is supported for any "xxx-
862   supported", then the 'any-name' value MUST be supported.

863   If the Set-Job-Attributes operation is supported, then the "job-settable-attributes" Printer Description
864   attribute and the 'default' out-of-band value MUST be supported.

865   If the Set-Printer-Attributes operation and the "printer-message-from-operator" Printer Description attribute
866   are supported, then the latter MUST be settable.

867   If the Set-Job-Attributes operation and the "job-message-from-operator" Printer Description attribute are
868   supported, then the latter MUST be settable.

869   It is OPTIONAL for the Printer object to support the "printer-message-time" (integer),) and "printer-
870   message-date-time" (dateTime) and "printer-message-operation" (type2 enum). If both the "printer-
871   message-time" (integer) and the "printer-current-time" (dateTime) (see [ipp-mod] section 4.4.30) Printer
872   Description attributes are supported, then the "printer-message-date-time" (dateTime) attribute MUST be
873   supported.

874   10   IANA Considerations

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

877   ftp.isi.edu/iana/assignments/ipp/operations/set.txt

878   1211   Internationalization Considerations

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

880   1312   Security Considerations

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

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         Semantics", RFC 2566, April 1999.

15   Change History

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

15.1   Changes to the January 4, 2000 version to make the January 20, 2000 version

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

1. Replaced the "factory-settings" operation attribute proposed to be added to the Get-Printer-Attributes operation with the Get-Rest-Printer-Attributes operation which returns the reset values and the possible "xxx-supported" values.

2. Added the out-of-band 'any-name' value to be used with "xxx-supported" attributes with attribute syntax 'type3 keyword | name' to indicate that any name will be accepted in a Job Creation operation for configurations that support such a concept.

3. Added authentication-methods-supported (1setOf type2 keyword) and security-methods-supported (1setOf type2 keyword) Printer Description attributes so that clients can discover the possible values for use in Set-Printer-Attributes to set "uri-authentication-supported" and "uri-security-supported" attributes, since the Reset-Printer operation doesn't change them.

4. Added validation rules that the Printer MUST use to validate a Set-Printer-Attributes request.

5. Clarified that the Set-Printer-Attributes operation MUST NOT have any side effects on other attributes, unless explicitly specified in this document.

6. Moved the specification of the attributes that MUST be READ-ONLY to Appendix A.

7. Added the "document-format-varying-attributes" (1setOf type2 keyword)

8. Added the REQUIRED "document-format-varying-scope" operation attribute to Set-Printer-Attributes in order to control whether one or all document formats are affected for those attributes that vary by document format.

9. Clarified that the Printer returns the 'client-error-attributes-not-settable' status code in a Set-Printer-Attributes response whether the attribute is READ-ONLY, the attribute is not supported, or the value is not supported.

10. Added the out-of-band 'default' value for use with Set-Job-Attributes and Job Creation operations.

11. Deleted the "printer-message-operation" Printer Description attribute.

12. Made the "Get-Reset-Printer-Attributes" operation, along with the "authentication-methods-supported" and the "security-methods-supported" Printer Description attributes REQUIRED, if the Set-Printer-Attributes operation is supported.

13. Made the 'not-settable' out-of-band value and the 'client-error-not-settable' status code REQUIRED, if the Set-Printer-Attributes operation is supported.

14. Made the 'default' out-of-band value REQUIRED, if the Set-Job-Attributes operation is supported.

15. Removed the requirement that "xxx-supported" Printer Description attributes that contain only one value be read-only.

973   15.2 Changes to the December 8, 1999 version to make the January 4, 2000 version

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

976   1. Removed the Set operations and related items from the Set2 specification [ipp-set2] to create this Set
977   specification.

978   2. Added that an attribute that can only be set to one fixed value SHOULD NOT be included in the
979   "printer-settable-attributes" or "job-settable-attributes" attributes.

980   3. Indicated that the encoding of the 'not-settable' out-of-band value is TBD.

981   4. Added that Set-Job-Attributes operation adds an attribute to the Job object if it wasn't already there

982   5. Added the conformance section to make it easy to understand the conformance requirements.

983   16   Appendix AB: Allowed Values for Set-Printer-Attributes

984   This appendix contains a table of all IPP/1.1 attributes. Each row contains

985   An attribute and

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

989   The allowed values include the following cases:

990   1. Read-only: the Set-Printer-Attributes operation cannot change this attribute

991   2. Any of "*xxx*-supported": the Set-Printer-Attributes operation accepts values that are allowed
992   according to the IPP/1.1 rules for the "xxx-supported" attribute (see section 3.1.2.3 of the "Internet
993   Printing Protocol/1.1: Implementer's Guide" [ipp-iig]). The 'xxx-supported' attribute value is
994   obtained from 'Get-Printer-Attributes'.

995   3. Any of Reset "*xxx*-supported": the Set-Printer-Attributes operation accepts values that are allowed
996   according to the IPP/1.1 rules for the "xxx-supported" attribute (see section 3.1.2.3 of the "Internet
997   Printing Protocol/1.1: Implementer's Guide" [ipp-iig]). The "xxx-supported" attribute value is
998   obtained from Get-Reset-Printer-Attributes (see below).

999   4. Any value of the proper syntax type: the Set-Printer-Attributes accepts any value of the specified
1000   syntax type. The types supported are enumerated below.

1001   a.   Any text(127)
1002   b.   Any name(127)
1003   c.   Any uri
1004   d.   Any boolean
1005   e.   Any positive integer

1006   f.   Any datetime
1007   g.   1setOf any uri
1008   5.   Combination of 'Any of Reset "*xxx*-supported"' or 'Any name'.

1009   If a Printer implementation doesn't want to allow values of any syntax type, it can make the value be read-
1010   only. For example, for a monochrome printer the attribute "color-supported" is "false" and must be read-
1011   only. Otherwise an admin could set it to "true" because the value can have "any boolean".

1012   **Table 2 - Values allowed for Job Template Attributes in the Set-Job-Attributes Operation**

1013

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"
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"

1014

1015   **Table 3 - Values allowed for Job Description Attributes in the Set-Job-Attributes Operation**

1016
1017

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

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

1018

1019 **Table 4 - Values allowed for Printer Job Template Attributes in the Set-Printer-Attributes Operation**

1020

1021

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))	Any integer(1:100)
job-hold-until-supported (1setOf(type3 keyword | name (MAX)))	Any of Reset "xxx-supported" or any name
job-sheets-supported (1setOf(type3 keyword | name(MAX)))	Any of Reset "xxx-supported" or any name

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

1022

1023 **Table 5 - Values allowed for Printer Description Attributes in the Set-Printer-Attributes Operation**

1024

Printer Description Attributes	Values allowed for Set
printer-uri-supported (1setOf uri)	1setOf Any uri
uri-authentication-supported (1setOf type2 keyword)	Any of Reset "xxx-supported";use authentication-methods-supported
uri-security-supported (1setOf type2 keyword)	Any of Reset "xxx-supported"; use security-methods-supported
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)	*Read-only*
printer-state-reasons (1setOf type2 keyword)	*Read-only*
printer-state-message (text(MAX))	*Read-only*
ipp-versions-supported (1setOf type2 keyword)	Any of Reset "xxx-supported"
operations-supported (1setOf type2 enum)	Any of Reset "xxx-supported"
multiple-document-jobs-supported (boolean)	Any of Reset "xxx-supported"
charset-configured (charset)	Any of "xxx-supported"
charset-supported (1setOf charset)	Any of Reset "xxx-supported"
natural-language-configured (naturalLanguage)	Any of "xxx-supported", use generated-natural-language-supported
generated-natural-language-supported (1setOf naturalLanguage)	Any of Reset "xxx-supported"

Printer Description Attributes	Values allowed for Set
document-format-default (mimeMediaType)	Any of "xxx-supported"
document-format-supported (1setOf mimeMediaType)	Any of Reset "xxx-supported"
printer-is-accepting-jobs (boolean)	Read-only
queued-job-count (integer(0:MAX))	Read-only
printer-message-from-operator (text(127))	Any text(127)
color-supported (boolean)	Any boolean
reference-uri-schemes-supported (1setOf uriScheme)	Any of Reset "xxx-supported"
pdl-override-supported (type2 keyword)	Any of Reset "xxx-supported"
printer-up-time (integer(1:MAX))	*Read-only*
printer-current-time (dateTime)	Any dateTime
multiple-operation-time-out (integer(1:MAX))	any positive integer
compression-supported (1setOf type3 keyword)	Any of Reset "xxx-supported"
job-k-octets-supported (rangeOfInteger(0:MAX))	Any of Reset "xxx-supported"
job-impressions-supported (rangeOfInteger(0:MAX))	Any of Reset "xxx-supported"
job-media-sheets-supported (rangeOfInteger(0:MAX))	Any of Reset "xxx-supported"
pages-per-minute (integer(0:MAX))	Read-only
pages-per-minute-color (integer(0:MAX))	Read-only
printer-message-time	Read-only
printer-message-date-time	Read-only

1025

1026   17   Appendix BA: Full Copyright Statement

1027   Copyright (C) The Internet Society (1998,1999). All Rights Reserved

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