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# The Printer Working Group (PWG)
Standard for
The Internet Printing Protocol (IPP):
Job Extensions

10
11 **Abstract:** This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model.
12 This specification defines some new Operation attributes for use in Job Creation and Document Creation operations.
13 The Printer copies these Operation attributes to the corresponding Job Description attributes, which the clients may
14 query.  The Document Creation Operation attributes describe the Document Content and permit the Printer to reject
15 requests that it cannot process correctly.  Some corresponding "xxx-default" and "xxx-supported" Printer attributes
16 are defined.  This specification defines some Job Template attributes that apply to a multi-document Job as a whole
17 and the "output-device" Job Template attribute that can apply to Documents and to Sheets as well as Jobs.  This
18 specification also defines some additional values for the "job-state-reasons" Job Description attribute.  Each of the
19 attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.
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23  Working Draft, July 28, 2003

# The Printer Working Group (PWG)
## Standard for
## The Internet Printing Protocol (IPP):
## Job Extensions

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30  This version of the PWG Proposed Standard is available electronically at:

31
32      ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030728.pdf, .doc, .rtf

33  This document is a Working Draft for an IEEE-ISTO PWG Candidate Standard. For a definition of a "PWG
34  Candidate Standard" and its transition to a "PWG Standard", see: ftp://ftp.pwg.org/pub/pwg/general/pwg-
35  process.pdf. After approval by the PWG (by a Last Call) to transition a PWG Working Draft to a PWG Candidate
36  Standard, the resulting PWG Candidate Standard will be available electronically at: ftp://ftp.pwg.org/pub/pwg/cs/.
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86 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and
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102           subscribe ipp
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104 Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any
105 discussions of clarifications or review of registration proposals for additional names.  Requests for additional
106 extensions, for inclusion in this specification, should be sent to the IPP Mailing list for consideration.  In order to
107 reduce spam the mailing list rejects mail from non-subscribers, so you must subscribe to the mailing list in order to
108 send a question or comment to the mailing list.

109 # Contents

## Table of Tables

## 1   Introduction and Summary

This IPP specification is an assortment of attributes and values that extend the Job semantics of the IPP Model and Semantics [rfc2911]. This specification defines some new Operation attributes for use in Job Creation and Document Creation operations. The Printer copies these Operation attributes to the corresponding Job Description attributes, which the clients may query. The Document Creation Operation attributes describe the Document Content and permit the Printer to reject requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-supported" Printer attributes are defined. This specification defines some Job Template attributes that apply to a multi-document Job as a whole; their names start with "job-" to indicate their job-wide scope. This specification defines the "output-device" Job Template attribute that can apply to Documents and to Sheets as well as Jobs. This specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of the attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.

This specification is an IPP extension referenced by the PWG Semantic Model [pwg-sm]. The purpose for these extensions is so that the print industry can have a common semantic specification for use in IPP, the PWG Semantic Model [pwg-sm], the PWG Print Service Interface (PSI) project [pwg-psi], the PWG IPP Fax (IPPFAX) project [ippfax], and the Free Standards Group Job Ticket API [fsg-jt].

### 1.1   Attributes Summary

Table 1 summarizes the Operation attributes defined in this specification for use with Job Creation operations. The Printer copies these Operation attributes to corresponding Job Description attributes defined in this specification.

**Table 1 - Summary of Job Creation Operation attributes**

| Operation attribute | Printer support | Description |
|---|---|---|
| ipp-attribute-fidelity (boolean) | MUST | Allows the client to control whether or not the Printer MUST support *all* Job Template attributes supplied in Job Creation operation, else the Printer MUST reject the job. Defined in [rfc2911] section 3.2.1.2 and 15. |
| job-mandatory-attributes (1setOf type2 keyword) | MAY | Allows the client to list the Job Template attributes that the Printer MUST support when supplied in the Job Creation operation, else the Printer MUST reject the job. |

Table 2 summarizes the Operation attributes defined in this specification for use with Job Creation operations and Send-Document and Send-URI operations. These Operation attributes allow the client to supply descriptions of the Document Content to the Printer about individual Document Contents at request time. When supplied in a Job Creation request, these Operation attributes provide defaults for the Document or Documents of the Job. When supplied in a Document Creation operation, they describe the Document explicitly. This specification does *not* define corresponding Document Description attributes, since this specification does not include or depend on a Document object[1].

---

[1] For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].

269                              **Table 2 - Summary of Job and Document Creation Operation attributes**

| Operation attribute | Printer support | Description |
|---|---|---|
| document-charset (charset) | MAY | The charset of the Document content |
| document-digital-signature (type2 keyword) | MAY | The type of digital signature, if any, used in the Document Content. |
| document-format-details (1setOf collection) | MAY | The details of the Document Content, including when it's a package of files (e.g., zip, multipart/related). The details include information, such as the application and the operating system that created the document, the intended device type (when the format is device-dependent), and the natural languages of the document. |
| document-format-version (text(127)) | MAY | The version of the document format. |
| document-format-natural-language (naturalLanguage) | MAY | The primary natural language of the Document Content. |

270
271  Table 3 summarizes the Job Template attributes defined in this specification for use with Job Creation operations.
272  The Job Template attributes that have a "job-" prefix are defined to apply to the Job as a whole, independent of the
273  value of the "multiple-document-handling" Job Template attribute ([rfc2911] section 4.2.4), whose 'separate-
274  documents-collated-copies' and 'separate-documents-uncollated-copies' values cause the Printer to produce
275  separate Output Documents. The "output-device" Job Template attribute is not restricted to be job-wide and can be
276  supplied in Document Creation operations and in the "override" attribute to override at the Sheet level (see section
277  8). When supplied in a Document Creation operation, the "output-device" Job Template attribute describes the
278  Document explicitly. This specification does *not* define corresponding Document Description attributes, since this
279  specification does not include or depend on a Document object[2].
280

281                                  **Table 3 - Summary of Job Template Attributes**

| Job Template attribute | Printer support | Description |
|---|---|---|
| job-copies (integer(1:MAX)) | MAY | The number of copies of the entire Job. |
| job-cover-back (collection) | MAY | The cover for the back of the entire Job. |
| job-cover-front (collection) | MAY | The cover for the front of the entire Job. |
| job-finishings (1setOf type2 enum) | MAY | The finishing for the entire Job. |
| job-finishings-col (1setOf collection) | MAY | The finishing characteristics for the entire Job. |
| output-device (name(127)) | MAY | Allows the client to indicate a preference for output devices, for a Printer that supports one or more output device (see fan-out in [rfc2911] section 2.1). |

282  # 2  Terminology

283  This section defines terminology used throughout this document.

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[2] For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].

## 2.1 Conformance Terminology

284

285 Capitalized terms, such as **MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY,** and **OPTIONAL**, have
286 special meaning relating to conformance as defined in RFC 2119 [rfc2119].

## 2.2 Other Terminology

287

288 This document uses the same terminology as [rfc2911], such as "**client**", "**Printer**"[3], "**attribute**", "**attribute value**",
289 "**keyword**", "**Job Template attribute**", "**Operation attribute**", "**operation**", "**request**", "**response**", and "**support**"
290 (see [rfc2911] section 12.2.3) with the same meaning. In addition, the following terms are defined for use in this
291 document:

292 **Document Creation operation** - operations that accept Document Content. Specifically: Print-Job, Print-URI, Send-
293 Document and Send-URI. Note: Print-Job and Print-URI are both **Job Creation** and **Document Creation**
294 operations.

295 **Finished Document -** the result that the Printer produces on **Sheets** after the operations of printing, folding, cutting,
296 finishing, etc. are completed.

297 **Job Attribute** - an **Operation attribute** or a **Job Templat**e attribute that applies to the Job (object) as a whole. For
298 example, "job-name" is an **Operation attribute** and "job-priority" is a **Job Template attribute**.

299 **Job Creation operation** - operations that create Job objects, specifically: Print-Job, Print-URI, and Create-Job as
300 defined in [rfc2911].

301 **Operation attribute** - an attribute supplied by a client in the Operation Attribute group of a request in order to affect
302 the behavior of the operation or an attribute returned by the Printer in the Operation Attributes group in an operation
303 response in order to report the results of the operation. For some Operation attributes, the Printer copies the values
304 supplied by the client to corresponding Job Description attributes.

305 **Page** - The term "Page" used throughout this document is a synonym for PDL page.

306 **PDL Page** - A "PDL Page" is a page according to the definition of pages in the language used to express the
307 document data. Note: If the PDL contains multiple original source pages that have been placed on a single page by
308 the client application, then the PDL page count is one. On the other hand, if the client requests that multiple PDL
309 Pages are placed on a single side of media, by supplying "number-up" with a value greater than 1, then the PDL
310 page count will be more than one. [rfc2911] uses the term "print stream page" for PDL Page.

311 **Sheet** - A Sheet is the unit of media that a printer puts marks on. It is the most basic unit of output from a printer. A
312 printer may mark on one side or on both sides of a sheet.

## 3 Operation Attributes for Job Creation and Document Creation operations

313

314 This section defines Operation attributes for use in Job Creation operations and/or Document Creation operations
315 and as such describe characteristics of the Job and Document, rather than instructions to the Printer. For some of
316 these Operation attributes there are corresponding "xxx-default" and "xxx-supported" Printer Description attributes
317 (see section 7).

---

[3] [rfc2911] uses the terms "Printer object" and "Printer" interchangeably to mean the same thing. For simplicity, this
document uses the term "Printer" exclusively, except for definitions copied directly from [rfc2911]. Nonetheless, the
intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server.

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318  Table 4 lists the Operation attributes and their attribute syntaxes supplied in Job Creation and Document Creation
319  operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer Description
320  attributes, if any.  A "-" indicates that there isn't an "xxx-default" or "xxx-supported" Printer Description attribute.

321                              **Table 4 - Operation, Default, and Supported Attributes**

| **Operation attribute**:<br><br>**attribute name "xxx"** | Operation attribute syntax | Printer: Default Value attribute syntax "xxx-default" | Printer: Supported Values attribute syntax "xxx-supported" |
|---|---|---|---|
| **document-charset** | charset | charset | 1setOf charset |
| **document-digital-signature** | type2 keyword | type2 keyword | 1setOf type2 keyword |
| **document-format** | mimeMediaType | mimeMediaType | 1setOf mimeMediaType |
| **document-format-details** | 1setOf collection | 1setOf collection | 1setOf type2 keyword |
| document-source-application-name | name(MAX) | name(MAX) | - |
| document-source-application-version | text(127) | text(127) | - |
| document-source-os-name | name(40) | name(40) | - |
| document-source-os-version | text(40) | text(40) | - |
| document-format | mimeMediaType | mimeMediaType | - |
| document-format-device-id | text(127) | text(127) | - |
| document-format-version | text(127) | text(127) | - |
| document-natural-language | naturalLanguage | naturalLanguage | - |
| **document-format-version** | text(127) | text(127) | 1setOf text(127) |
| **document-message** | text(MAX) | - | - |
| **document-name** | name(MAX) | - | - |
| **document-natural-language** | naturalLanguage | naturalLanguage | 1setOf naturalLanguage |
| **ipp-attribute-fidelity** | boolean | - | - |
| **job-mandatory-attributes** | 1setOf type2 keyword | - | - |
| | | | |

Deleted: **output-device-requested**

Deleted: **output-device**

Inserted: **output-device**

Deleted: name(127)

Deleted: name(127)4

Deleted: -

Inserted: -

Deleted: 1setOf name(127)

Deleted: 5

Deleted: DMC ISSUE: Need to add document-message and document-name to above table, as well as other places in the spec.¶

322  Table 5 lists the Operation attributes that clients supply in Job and Document Creation operations and whether the
323  Printer copies (indicated by "⇒") the supplied value to the corresponding Job Description[6] attribute.  The following
324  statements apply to all Operation attributes for Job and Document Creation operations and are *not* repeated in each
325  Operation attribute Description:

326          If the Printer doesn't support the "xxx" Operation attribute, the Printer MUST ignore the "xxx" attribute (as
327          with any OPTIONAL Operation attribute) and return the "xxx" attribute with the supplied value as
328          unsupported in the Unsupported Attributes group as specified in [rfc2911] section 3.1.7.

329          If the Printer supports the "xxx" Operation attribute, the Printer MUST also:

330              1.  support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if
331                  defined (see Table 4 and section 7).  If the Printer supports either of the "xxx-default" or "xxx-

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[6] The operations defined for Document Creation operations do not have corresponding Document Description attributes defined in this specification, since this specification does not assume that there is a Document object.  See [ippdoc] for the corresponding Document Description attributes.

332      supported" Printer Description attributes, then the Printer MUST also support the corresponding
333      Operation attribute.

334          2.   validate the values supplied by the client in the "xxx" Operation attribute against the values indicated
335               in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 7).  If the
336               values do not validate, the Printer MUST perform one of the actions indicated for that Operation
337               attribute, unless explicitly specified otherwise in the Description, such as (1) reject the request, (2)
338               accept the request and either (a) hold the job for operator intervention or (b) print the Job ignoring
339               the attribute.  In all of these cases, the Printer MUST return the Operation attribute with the
340               unsupported value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

| Legend: | |
|---|---|
| "**Operation**" | Column indicates the operation attribute names for Job and Document Creation *requests.* |
| "**\***" | Following attribute name indicates value sent on Create-Job, Print-Job and Print-Uri is the default for all the Documents in the Job. |
| "**Creation operations**" | Column indicates which operations the Operation attribute can be supplied in: PJ=Print-Job, PU=Print-URI, CJ=Create-Job,  SD=Send-Document, and SU=Send-URI. |
| "**y**" | The Operation attribute is defined for use with the indicated operations. |
| "**y⇒**" | The Operation attribute is defined for use with the indicated operations.  It has a corresponding Job Description attribute (see section 4.1.5.4) defined that the Printer MUST support and to which the Printer MUST copy this Operation attribute, if it supports the Operation attribute.  See Table 4 for whether there are corresponding "xxx-default" and "xxx-supported" Printer Description attributes defined. |
| "**y⇒\*\***" | The Operation attribute is defined for use with the indicated operations and has a corresponding Job Description attribute (see section 4.1.5.4).  (Note that these attributes are properties of a Document but are copied to the Job.)   These document related Job attributes use the naming convention of "xxx-supplied".  Printer MUST support the "xxx-supplied" attributes and MUST copy this Operation attribute to it, if it supports the Operation attribute.  See Table 4 for whether there are corresponding "xxx-default" and "xxx-supported" Printer Description attributes defined. |
| "**-**" | the Operation attribute is *not* defined for the indicated operation. |
| "**Conformance**" | column indicates the conformance requirements for what the client supplies in a request and the Printer supports in a request.  For (indented) member attributes, a MUST means if the collection attribute is supplied or supported. |
| "**Section**" | column indicates where the Operation attribute is defined in this spec. |

341

342                 **Table 5 - Operation Attributes supplied in Job and Document Creation Requests**

| **Operation attribute name** | **Attribute Syntax** | **Creation operations** | | | **Conformance** | | **Section** |
|---|---|---|---|---|---|---|---|
| | | CJ | PJ, PU | SD, SU | Client supply | Printer support | |
| The following 10 Operation attributes have corresponding "xxx-supplied" Job Description attributes: | | | | | | | |
| compression | type2 keyword | y⇒\*\* | y⇒\*\* | y | MAY | MAY | §3.2.1 |
| **document-charset\*** | charset | y⇒\*\* | y⇒\*\* | y | MAY | MAY | §3.2.2 |
| **document-digital-signature\*** | type2 keyword | y⇒\*\* | y⇒\*\* | y | MAY | MAY | §3.2.3 |
| **document-format\*** | mimeMediaType | y⇒\*\* | y⇒\*\* | y | MAY | MUST | §3.2.4 |
| **document-format-details\*** | 1setOf collection | y⇒\*\* | y⇒\*\* | y | MAY | MAY | §3.2.5 |

| Operation attribute name | Attribute Syntax | Creation operations | | | Conformance | | Section |
|---|---|---|---|---|---|---|---|
| | | CJ | PJ, PU | SD, SU | Client supply | Printer support | |
| document-source-application-name* | name(MAX) | y⇒ | y⇒ | y | MAY | MAY | §3.2.5.1 |
| document-source-application-version* | text(127) | y⇒ | y⇒ | y | MAY | MAY | §3.2.5.2 |
| document-source-os-name* | name(40) | y⇒ | y⇒ | y | MAY | MAY | §3.2.5.3 |
| document-source-os-version* | text(40) | y⇒ | y⇒ | y | MAY | MAY | §3.2.5.4 |
| document-format* | mimeMediaType | y⇒ | y⇒ | y | MUST | MUST | §3.2.5.5 |
| document-format-device-id* | text(127) | y⇒ | y⇒ | y | MAY | MAY | §3.2.5.6 |
| document-format-version* | text(127) | y⇒ | y⇒ | y | SHOULD | MUST | §3.2.5.7 |
| document-natural-language* | naturalLanguage | y⇒ | y⇒ | y | MAY | MAY | §3.2.5.8 |
| document-format-version* | text(127) | y⇒** | y⇒** | y | MAY | MAY | §3.2.6 |
| document-message* | text(MAX) | y⇒** | y⇒** | y | MAY | MAY | §3.2.7 |
| document-name* | name(MAX) | y⇒** | y⇒** | y | MAY | MUST | §3.2.8 |
| document-natural-language* | naturalLanguage | y⇒** | y⇒** | y | MAY | MAY | §3.2.9 |
| ipp-attribute-fidelity | boolean | y⇒ | y⇒ | - | MAY | MUST | §3.1.1, |
| job-mandatory-attributes | 1setOf type2 keyword | y⇒ | y⇒ | - | MAY | MAY | §3.1.2 |

343

## 3.1 Operation attributes for Job Creation operations only

345 This section defines additional operation attributes that the client MAY supply in Job Creation operations (Print-Job,
346 Print-URI, and Create-Job) and Validate-Job, but not in Send-Document or Send-URI operations.

### 3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

348 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client
349 supplies unsupported Job Template attributes[7] or values in a Job Creation operation. The value 'true' indicates that
350 total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the
351 client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation.

352 The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 5.1.2).

#### 3.1.1.1 Why there are no "ipp-attribute-fidelity-default" and "ipp-attribute-fidelity-supported" attributes

354 Because [rfc2911] defines the default value to be 'false' there is no point to define an "ipp-attribute-fidelity-default"
355 Printer Description attribute. Because [rfc2911] REQUIRES a Printer to support the "ipp-attribute-fidelity" Operation
356 attribute there is no need for an "ipp-attribute-fidelity-supported" Printer Description attribute.

### 3.1.2 job-mandatory-attributes (1setOf type2 keyword)

358 This OPTIONAL Operation attribute permits the client to identify which Job Template attributes the Printer MUST
359 support in this Job Creation request in order to accept the Job. The Printer MUST reject this Job Creation operation
360 if the client supplies an unsupported Job Template attribute or value in the request that is also identified in this list.

---

[7] The value of the "ipp-attribute-fidelity" Operation attribute has no effect on other O*peration* attributes supplied by the client, only on Job Template attributes supplied by the client.

361 The client MAY supply the "job-mandatory-attributes" Operation attribute in a Job Creation operation or Validate-Job
362 operation and MUST NOT supply this attribute in any other operation. If the Printer supports the "job-mandatory-
363 attributes" Operation attribute, the Printer MUST support this attribute in all Job Creation operations that it supports
364 and in the Validate-Job operation.

365 If the client supplies the "job-mandatory-attributes" Operation attribute and the 'ipp-attribute-fidelity" Operation
366 attribute with the 'true' value, the Printer MUST ignore the "job-mandatory-attributes", since the client is requesting
367 that all of the supplied Job Template attributes in the Job Creation request MUST be supported in order for the
368 Printer to accept the Job.

369 The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see
370 section 5.1.3) for auditing and trouble-shooting purposes[8].

371 The values of the "job-mandatory-attributes" attribute are the keyword attribute names that identify Job Template
372 attributes; for example, 'job-hold-until', 'job-finishings' (see section 4.1.3.3), 'copies' and 'media'. In order to identify a
373 member attribute of a collection attribute, the keyword names of both the collection attribute and the member
374 attribute are given separated by a period (.) character. For example, to make the "media" attribute of the "cover-
375 front" collection attribute mandatory, supply the keyword value: 'cover-front.media'.

376 The Printer MUST accept *any* keyword values for the "job-mandatory-attributes" attribute itself whether or not the
377 corresponding Job Template attributes are supported by the Printer and MUST NOT return any unsupported
378 keywords in the Unsupported Attributes Group in the response. If the client supplies this "job-mandatory-attributes"
379 Operation attribute in a Job Creation operation with values that represent Job Template attributes that the Printer
380 doesn't support, the Printer MUST otherwise accept the attribute anyway. The Printer MUST reject this Job Creation
381 only if the client *actually supplies* any of the identified Job Template attributes that the Printer doesn't support.
382 Because the Printer doesn't reject when the "job-mandatory-attributes" Operation attribute has unsupported attribute
383 keyword names, the client MAY supply all of the attribute keyword names that the client supports without having to
384 tailor the list to the particular Printer to which the client is submitting the Job Creation operation, thereby simplifying
385 client use of this attribute.

386 Note: The "job-mandatory-attributes" has nothing to do with whether the Printer overrides the PDL with the identified
387 Job Template attributes (see [rfc2911] sections 4.4.28 and 15).

**3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported"**
388
389        **Printer Description attributes**

390 By definition, omission of the "job-mandatory-attributes" Operation attribute (and the "ipp-attribute-fidelity" Operation
391 attribute with a 'false' value or omitted) means that the client is requesting that none of the supplied Job Template
392 attributes need to be supported in order to accept the Job, i.e., the Printer MUST NOT reject the job because of any
393 unsupported Job Template attributes. So the default is an empty list, so there is no point to have a "job-mandatory-
394 attributes-default" Printer attribute.

395 By definition, the client can supply any Job Template attribute in the value list of the "job-mandatory-attributes"
396 Operation attribute, whether or not the Printer actually supports that Job Template attribute. Therefore, it is not
397 possible to have a "job-mandatory-attributes-supported" list, since all possible keywords would have to be expressed.

398 Note: the client MAY query the Printer's "job-creation-attributes-supported" (see [ippsave] section 7.1) and
399 "document-creation-attributes-supported" (see [ippdoc] section 10.1) to see which Job Template and Document
400 Template attributes the Printer actually supports.

---

[8] The Printer uses the "job-mandatory-attributes" Job Description attribute for validating subsequent Document
Template attributes supplied in Send-Document and Send-URI operations for this job when also supporting [ippdoc],
where the client can supply Document Template attributes.

401   **3.2 Operation attributes for both Job and Document Creation operations**

402   This section defines the semantics for the Operation attributes that a client MAY supply in a Job Creation operation
403   (Print-Job, Print-URI, Create-Job) or a Document Creation operation (Print-Job, Print-URI, Send-Document and
404   Send-URI).  Note: Print-Job and Print-URI are both Job Creation and Document Creation operations.

405   **3.2.1 compression (type2 keyword)**

406   This REQUIRED Operation attribute identifies the compression used for the Documents in this Job and is defined in
407   [rfc2911] section .  It is included in this specification, because this specification defines the corresponding
408   "compressions-supplied" Job Description attribute (see section 5.2.1.

409   **3.2.2 document-charset (charset)**

410   This OPTIONAL Operation attribute identifies the charset of the Document Content.  This Operation attribute is
411   intended to be supported by Printers that support a document-format in which the charset may be ambiguous in the
412   Document content, such as 'application/vnd.hp-PCL', where the charset escape sequence MAY be omitted from the
413   data.

414   If a client supplies the "document-charset" Operation attribute in a Document Creation operation with a value that the
415   Printer doesn't support, the Printer MUST reject the job and return the status code: 'client-error-charset-not-
416   supported' (see [rfc2911] section 3.1.4.14), since the interpretation of the content will be mis-understood by the
417   Printer.

418   The standard values for these attributes are Internet Media types (sometimes called MIME types).  For further details
419   see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9.

420   The Printer MUST support this attribute if it supports a document format for which the Document Content can be
421   ambiguous with respect to the charset being used to encode the data.  For example, the 'application/vnd.hp-PCL'
422   MAY omit the charset escape sequence.  Although [rfc2854] strongly RECOMMENDS that 'text/html', include a ";
423   charset=charset' parameter in the MIME type itself (that is, explicitly in the value of the "document-format" attribute),
424   often the charset= parameter is not present in the MIME type and the Printer MUST assume a charset.  Thus a
425   Printer that supports the text/html MIME type MUST support the "document-charset" operation attributes.  Also many
426   text files use the various 8-bit ISO 8859 charsets in which the lower half is US-ASCII and the upper half is various
427   Latin sets (about 8 or 9), Greek, Cyrillic, Hebrew, and Arabic.  Shift JIS is another example where the left half is US-
428   ASCII, but the right half can be one of a number of things.  But if the data doesn't contain the charset escape
429   sequences, this attribute can help the Printer know what the charset is in the Document.  Such document formats are
430   called "charset-ambiguous" document formats.  Finally, even though [rfc2046] REQUIRES the "; charset=" MIME
431   type parameter if the file contains other than US-ASCII, in practice, the "; charset=" MIME type parameter is often
432   omitted, thus making 'text/plain' a charset-ambiguous document format.  See the discussion in [rfc2911] section 4.1.9
433   and [rfc2046].

434   The Printer MAY also check the Document content while processing to see that the document data meets the coding
435   requirements for the supplied charset.  If the data contains something that is outside the charset encoding, the
436   Printer MUST either (1) hold the job or (2) abort, and SHOULD NOT continue printing square boxes for encoded
437   characters that are outside the charset supplied by the client.

438   Many other document formats, such as 'application/postscript' and 'application/pdf', are *not* charset-ambiguous, so
439   that Printers that support only such formats MAY omit support of the "document-charset" Operation/ Description
440   attributes.

441   If the Printer supports the "document-charset" Operation attribute, it MUST also support the corresponding
442   "document-charset-default" and "document-charset-supported" Printer Description attributes as well and vice versa
443   (see sections 7.1 and 7.2).

444    ### 3.2.3 document-digital-signature (type2 keyword)

445    This OPTIONAL Operation attribute identifies the technology of digital signature in the Document content.

446    If a client supplies this "document-digital-signature" Operation attribute in a Document Creation operation with a
447    value that the Printer doesn't support, the Printer MUST perform one of the following actions depending on
448    implementation: (1) reject the request OR (2) accept the request, set the Job's "job-state-reasons" attribute to
449    'digital-signature-type-not-supported' (see section 6.1), and either (a) put the Job in the 'pending-held' state or (b)
450    process the job ignoring the attribute. See section 3 above for more details.

451    If the Printer supports this attribute and the value supplied by the client, the Printer MAY verify the signature
452    according to the rule for that signature format and "document-format". If the signature does not verify, then the
453    Printer MUST perform one of the following actions depending on implementation (which MAY depend on the
454    "document-format" and a site-established policy):

455    1.    ignore the signature (and MAY indicate on the printed output some how) and MUST set the Job's "job-state-
456          reasons" Job Description attribute with the 'digital-signature-did-not-verify' value (see section 6.1).

457    2.    put the job on hold and wait for human intervention and MUST set the Job's "job-state-reasons" Job
458          Description attribute with the 'job-digital-signature-wait' and 'digital-signature-did-not-verify' values (see
459          section 6.1), OR

460    3.    abort the job depending on implementation and/or site configuration and MUST set the Job's "job-state-
461          reasons" Job Description attribute with the 'job-aborted-by-system' and 'digital-signature-did-not-verify'
462          values (see section 6.1).

463    Different PDLs have different techniques of embedding the signature. If the Printer supports the "document-digital-
464    signature" attribute and the supplied "document-format", the Printer MUST accept the document. However, if the
465    Printer either doesn't support the value of the "document-digital-signature" Operation attribute or doesn't support the
466    technique used by the supplied "document-format" attribute, the Printer MUST either (1) ignore the signature or (2)
467    put the job on hold and wait for human intervention, depending on implementation. If the Printer doesn't support the
468    supplied value, the Printer MUST return the "document-digital-signature" attribute with its value as unsupported in the
469    Unsupported Attributes group as specified in [rfc2911] section 3.1.7.

470    The following standard keyword values are defined:

471          'dss':  Digital Signature Standard (DSS) [dss].

472          'none':  There is not a digital signature in the Document content. If this attribute is supported, the 'none'
473                  value MUST be implemented but MAY be removed by the administrator.

474          'pgp':  PGP Message Exchange Formats [rfc1991].

475          'smime':  Enhanced Security Services for S/MIME [rfc2634].

476          'xmldsig'  XML Digital Signature [xmldsig].

477    ### 3.2.4 document-format (mimeMediaType)

478    This REQUIRED Operation attribute (see [rfc2911] section 3.2.1.1) indicates the document format of the supplied
479    Document Content. If a client supplies the "document-format" Operation attribute with a value that the Printer doesn't
480    support, the Printer MUST reject the job and return the status code 'client-error-document-format-not-supported' (see
481    [rfc2911] section 3.1.4.11), since the Printer cannot process the data.

482    The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME
483    types, such as 'text/plain' [rfc2046], the "; charset=" parameter is defined which specifies the charset of the Document
484    content. The Printer MUST support the charset MIME parameter as well as the "document-charset" Operation

485 attribute (section 3.2.2) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further
486 details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the
487 "document-charset" Operation attribute (section 3.2.2).

488 Many printer languages in the Printer MIB do not have a MIME type registered with IANA.[9] It is the intent of the PWG
489 to registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a Printer Language
490 already has a registered MIME Media type or gets a registration in the future, then that MIME Type MUST be used in
491 preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the MIME Media type:
492 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL, so those MIME Media types
493 MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For example, the NEC NPDL
494 printer language from the Printer MIB does not have a MIME type registered with IANA. Therefore, the "document-
495 format" = 'application/vnd.PWG-NPDL' MUST be used.

496 Note: CIP4 did not agree to register MIME types for other organizations and standards. Instead, CIP4 will just add
497 values to the flat file that aren't MIME types. The values will not start with any of the MIME type roots: application/,
498 audio/, image/, message/, model/, multipart/, test/, or video.

499          ACTION ITEM (Tom and Ira): Propose a format for the file.

500 See also the "document-format-version" Operation attribute in section 3.2.6 and the "document-format-details"
501 Operation attribute in section 3.2.5.

502 ### 3.2.5 document-format-details (1setOf collection)

503 This OPTIONAL Operation attribute supplied in Document Creation operations summarizes the details of the
504 Document content, including any files contained in the Document. This Operation attribute is intended to be
505 supported by Printers that support a packaging document format, such as 'application/zip' or 'multipart/related', in
506 order to detail the contents. However, this Operation attribute MAY be used with any document format. See Table 6
507 for a list of the member attributes along with the client and Printer conformance requirements.

508 All member attributes, if supplied, MUST have contents. The value MUST NOT be omitted.

509 If a Printer supports a *packaging* MIME type, such as 'multipart/related' or 'application/zip', the Printer MUST support
510 this "document-format-details" Operation attribute. If a Printer does not support a packaging MIME type, it MAY omit
511 support of the "document-format-details" Operation attribute and Description attribute. The purpose of the
512 "document-format-details" Operation attribute is to describe the details of the document format or formats in the
513 supplied Document, including the packaging format itself, so that the Printer knows what to expect.

514 If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member
515 attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions
516 depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the
517 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for more details. However, if
518 the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST
519 reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections
520 3.2.2 and 3.2.4) and return the 'client-error-charset-not-supported' (see [rfc2911] section 13.1.4.16) or the 'client-
521 error-document-format-not-supported' (see [rfc2911] section 13.1.4.11) status-codes, respectively.

---

[9] Companies are urged to register there Printer languages with IANA using the 'application/vnd.XX-yyy vendor tree.
There has also been a long standing PWG proposal to register all of these as 'application/vnd.pwg-yyy.

522 For a packaging format, the "document-format-details" attribute does not provide means to associate each collection
523 value with particular document in the archive file, so it does not provide a "manifest"[10] of the packaging. One of the
524 packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be
525 the first collection value. The remaining collection values provide the summary of the details of the contained files in
526 any order.

527 There MUST NOT be any duplicate collection values, that is, no collection values with all the same member attribute
528 values; it's a set, not a sequence. So 100 PostScript files with the same details in a .zip file:

529      (1) MAY have one collection value with the "document-format" member attribute = 'application/zip' MIME type
530      value and MAY have additional member attributes that give details about the .zip file itself and

531      (2) MUST have one collection value containing a "document-format" member attribute =
532      'application/postscript' and MAY have additional member attributes that give the details about the PostScript
533      files.

534 If a file in a packaging file is itself a packaging file, the single "document-format-details" (1setOf collection) Operation
535 attribute SHOULD contain the flattened distinct collection values for all files at all nested levels. Therefore, the
536 "document-format-details" collection attribute is not recursively defined and MUST NOT contain the "document-
537 format-details" attribute as a member attribute.

538                          **Table 6 - "document-format-details" member Operation attributes**

| Member Attribute Name | Attribute Syntax | Client supplies | Printer Support | Member Attribute Section | Top Level Attribute Section |
|---|---|---|---|---|---|
| document-source-application-name | name(MAX) | MAY | MAY | 3.2.5.1 | N/A |
| document-source-application-version | text(127) | MAY | MAY | 3.2.5.2 | N/A |
| document-source-os-name | name(40) | MAY | MAY | 3.2.5.3 | N/A |
| document-source-os-version | text(40) | MAY | MAY | 3.2.5.4 | N/A |
| document-format | mimeMediaType | MUST | MUST | 3.2.5.5 | 3.2.4 |
| document-format-device-id | text(127) | MAY | MAY | 3.2.5.6 | N/A |
| document-format-version | text(127) | SHOULD | MUST | 3.2.5.7 | 3.2.6 |
| document-natural-languages | 1setOf naturalLanguage | MAY | MAY | 3.2.5.8 | 3.2.9 |

539
540 The client can determine which member attributes of the "document-format-details" are supported by querying the
541 Printer's "document-format-details-supported" (1setOf type2 keyword) Printer Description attribute (see section 7.6).

542 Table 6 shows that three of the member attributes also have comparable top level Operation attributes defined with
543 the same names. See the sections listed in the rightmost column. These three high level attributes have
544 corresponding "xxx-default" and "xxx-supported" Printer Description attributes. These values are also for use with
545 the corresponding three member attributes. The remaining member attributes do not have any corresponding "xxx-
546 default" and "xxx-supported" Printer Description attribute.

547 If a client supplies this "document-format-details" Operation attribute with a member attribute with a value that the
548 Printer doesn't support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept

---

[10] If the client wants to achieve a "manifest", that is a complete list of each file in a packaging, then the client needs to
extract each file from the package and submit each one in a separate Document Creation operation. Note: the client
can re-compress each file before sending, so the compression isn't lost when sending each document separately.

549 the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See
550 section 3 above for more details.

551 **3.2.5.1 document-source-application-name (name(MAX))**

552 This OPTIONAL member Operation attribute identifies the application that generated the document. The
553 value MUST be all lowercase in order to facilitate matching. The version number MUST NOT be included
554 (see the "document-source-application-version" attribute). Examples: "photoshop", "microsoft word",
555 "unknown".

556 **3.2.5.2 document-source-application-version (text(127))**

557 This OPTIONAL member Operation attribute identifies the version number of the application that created the
558 document. The value MUST be all lowercase in order to facilitate matching. The intent of this attribute is for
559 purposes of affecting the interpreting by the Printer for any formats for which the source application version
560 might have different semantics. Examples:

561 "8.1 (4331)" for Winzip®, "5.0.5 10/26/2001" for Acrobat®, "2000 (9.0.4119 sr-1)" for Microsoft® Word

562 If the client omits this member attribute, that matches with any version. Similarly, the Printer's member
563 attribute MAY be omitted or be a zero length string to indicate any.

564 **3.2.5.3 document-source-os-name (name(40))**

565 This OPTIONAL member Operation attribute identifies the name of the operating system on which the
566 document was generated. Valid values are the operating system names defined in the IANA Operating
567 System name registry [os-names] with the version number portion removed (see the "document-source-os-
568 version" attribute). IANA Operating System Names consist of up to 40 *uppercase* US-ASCII letters, hyphen
569 ("-"), period ("."), and slash ("/") characters. The value MUST be all lowercase in order to facilitate matching.

570 Possible example IANA OS Registry values: 'linux', 'macos', 'sun-os', 'unix', "unknown", 'windows'.

571 ACTION ITEM: Get Sun to register SOLARIS with IANA.(Tom H)

572 **3.2.5.4 document-source-os-version (text(40))**

573 This OPTIONAL member Operation attribute identifies the version of the operating system on which the
574 document was generated. Valid values include the version portion of any of the operating system names
575 defined in the IANA Registry [os-names]. The value MUST be all lowercase in order to facilitate matching.
576 The value MUST NOT include the name portion of the registered OS name (see "document-source-os-
577 name" attribute).

578 Possible example values for the indicated "document-source-os-name" value are:
579     for 'linux': '1.0', '1.2', '2,0', '2.2', '2.4'
580     for 'unix': 'bsd', 'v', 'v.1', 'v.2', 'v.3', 'pc'
581     for 'windows': '95', '98', 'ce', 'nt', 'nt-2', 'nt-3', 'nt-3.5', 'nt-3.51', 'nt-4', 'nt-5' (windows 2000),
582 ACTION ITEM: Get Microsoft to register NT-5.1 (maybe NT-5.2) with IANA.(Ira M)

583

584 **3.2.5.5 document-format (mimeMediaType)**

585 This REQUIRED member Operation attribute identifies the document format (see [rfc2911] §3.2.1.1) of the
586 collection value of which it is a member. The client MUST supply and the Printer MUST support this member
587 attribute in each collection value. The values for this member attribute are Internet Media types (sometimes

588  called MIME types) and have the same values and semantics as for the top level "document-format"
589  Operation attribute with the same name (see section 3.2.4 for the semantics).

590      **3.2.5.6 document-format-device-id (text(127))**

591  This OPTIONAL member Operation attribute identifies the type of device for which the document was
592  formatted, including manufacturer and model.  This attribute is intended to identify document formats that are
593  not portable, e.g., PDLs that are device dependent.  The value of this variable MUST exactly match the IEEE
594  1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST NOT be specified.  See
595  the Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples.
596  Here is an example showing only the required fields for a PostScript document:
597  `MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;`

598      **3.2.5.7 document-format-version (text(127))**

599  This REQUIRED member Operation attribute identifies the level or version of the document format identified
600  by the "document-format" member attribute.  The client MAY supply and the Printer MUST support this
601  member attribute if the Printer supports the "document-format-details" Operation attribute.  The semantics
602  and supported values of this "document-format-version" member attribute MUST be the same as for the top
603  level "document-format-version" Operation attribute with the same name (see section 3.2.6 for the
604  semantics).

605      **3.2.5.8 document-natural-language (1setOf naturalLanguage)**

606  This OPTIONAL member Operation attribute specifies the natural language(s) of the collection value of
607  which it is a member.  The values for this attribute are natural language codes (with optional country codes)
608  and have the same values and semantics as for the top level "document-natural-language"
609  (naturalLanguage) operation attribute with the same name (see section 3.2.9 for the semantics).  If the
610  document contains multiple natural languages, then the first value MUST be the primary language of the
611  document.

612  **3.2.6 document-format-version (text(127))**

613  This OPTIONAL Operation attribute identifies the level or version of the document format of the Document content
614  identified by the "document-format" Operation attribute (section 3.2.4).

615  If the client supplies this "document-format-version" Operation attribute, the client MUST also supply the "document-
616  format" Operation attribute (section 3.2.4), so that the Printer does not need to parse the "document-format-version"
617  string in order to determine the document format and version.

618  If a client supplies this "document-format-version" Operation attribute with a value that the Printer doesn't support as
619  indicated by the Printer's "document-format-version-supported" attribute (see section 7.8), the Printer MUST perform
620  one of the following actions, depending on implementation:  (1) reject the request OR (2) accept the request and
621  either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute.  See section 3 above for
622  more details.

623  The defined values are taken from the Printer MIB [rfc1759] langTC values (after removing the "lang") used in the
624  prtInterpreterLangFamily and the prtInterpreterLangLevel attributes (SNMP calls them "objects") separated by the "/"
625  character.  If there is no version, just the langTC prefix without the "/" is used.  Note: the Printer MIB
626  prtInterpreterLangVersion attribute is not used, since no standard values are given in the Printer MIB.

627  The short first field before the "/" character are unique, so that the version values are self-identifying so that all the
628  versions for all document formats can be combined into a single list for the Printer's "document-format-version-
629  supported" Printer attribute.  The first field also tends to be the acronym for the document format and often is also the

630 file name extension registered with IANA.  The Printer MIB shows the first field in uppercase for readability.
631 However, the Printer MUST perform case-insensitive matching of supplied values with supported values.  If the
632 common acronym includes a "/", such as TIFF/IT, the "/" is changed to "-" so that the first field ends with the first "/."

633 Example values:

634      'PS/3':  For Postscript level 3 [rfc1759].
635      'PCL/5e':  For PCL 5e [rfc1759].
636      'PDF/1.4':  For PDF version 1.4 [pdf]
637      'PDF/X-1a:2001':  For PDF/X-1a [iso15930]
638      'DCS/2.0'  For Document Color Separation (DCS), version 2.0.  [dcs2.0]
639      'TIFF-IT/FP:1998':  TIFF/IT [iso12639] - Full Page - baseline.
640      'TIFF-IT/CT:1998':  TIFF/IT [iso12639] - Continuous Tone picture data - baseline
641      'TIFF-IT/FP/P1:1998':  TIFF/IT [iso12639] - Full Page - profile 1
642      'TIFF-IT/CT/P1:1998':  TIFF/IT [iso12639] - Continuous Tone picture data - profile 1
643      'Automatic':  auto sense the format [rfc1759].  Is use in combination with the 'application/octet-stream' (see
644          [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 3.2.4).
645

#### 3.2.6.1 Why no "document-format-version-default"

647 There is no "document-format-version-default" since to be meaningful, the default would have to depend on the
648 "document-format".  Currently, there are no "xxx-default" attributes whose values depend on the value of other
649 attributes.  Thus an implementation is free to supply its own defaults that depend on the "document-format".

### 3.2.7 document-message (text(MAX))

651 This OPTIONAL Operation attribute contains a message from the user to the operator about the Document.

### 3.2.8 document-name (name(MAX))

653 The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations
654 (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation.  For the Print-Job, Print-URI, and
655 Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute[11].

### 3.2.9 document-natural-language (naturalLanguage)

657 This OPTIONAL Operation attribute specifies the primary natural language of the Document content (see [rfc2911]
658 section 3.2.1.1 and section 4.1.8).

659 If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
660 support, the Printer MUST perform one of the following actions:  (1) reject the request OR (2) accept the request and
661 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute.  See section 3 above for
662 more details.

663 The values MAY include region as well as the language according to [rfc2911 section 4.1.8. If the document
664 contains more than one language, the value is the first or primary language of the document.  The Printer MAY use
665 this value to select fonts or other Globalization processing.  As indicated in [rfc2911] section 4.1.8, example include:

666      'en':  for English
667      'en-us':  for US English

---

[11] For the Send-Document and the Send-URI Operation attribute, the Printer copies them to the corresponding
Document Description attribute defined in [ippdoc].

668      'fr':  for French
669      'de':  for German
670

# 4   Job Template attributes

672   Table 7 lists the new Job Template attributes defined in this specification.  These Job Template attributes can be
673   supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations and the Validate-Job
674   operation.

675   Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request.  If
676   a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so
677   that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section
678   4.2).  In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the
679   corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined.

680                               **Table 7 - Job Template attributes**

| Job Template attribute name "xxx" | Attribute Syntax | Printer: Default Value attribute syntax "xxx-default" | Printer: Supported Values attribute syntax "xxx-supported" |
|---|---|---|---|
| **job-copies** | integer(1:MAX) | integer(1:MAX) | rangeOfInteger(1:MAX) |
| **job-cover-back** | collection | collection | 1setOf type2 keyword |
| cover-type | type2 keyword | - | 1setOf type2 keyword |
| media | type3 keyword \| name(MAX) | - | 1setOf (type3 keyword \| name(MAX)) |
| media-col | collection | - | 1setOf type2 keyword |
| *member attributes [pwg5100.3]* | *See* [pwg5100.3] | - | - |
| **job-cover-front** | collection | collection | 1setOf type2 keyword |
| *member attributes - same as* **job-cover-back** | **see job-cover-back** | | |
| **job-finishings** | 1setOf type2 enum | 1setOf type2 enum[12] | 1setOf type2 enum |
| **job-finishings-col** | collection | collection[12] | 1setOf type2 keyword |
| finishing-template | name(MAX) | - | 1setOf name(MAX) |
| stitching | collection | | 1setOf type2 keyword |
| stitching-reference-edge | type2 keyword | - | 1setOf type2 keyword |
| stitching-offset | integer (0:MAX) | - | 1setOf (integer(0:MAX) \| rangeOfInteger(0:MAX)) |
| stitching-locations | 1setOf integer(0:MAX) | - | 1setOf (integer(0:MAX) \| rangeOfInteger(0:MAX)) |
| **output-device** | name(127) | - | 1setOf name(127) |
| **print-content-optimize** | **type2 keyword** | **type2 keyword** | 1setOf type2 keyword |

## 4.1 Job Template attributes defined for Job-wide effect in multi-document jobs

682   This section defines additional Job Template attributes that have Job-wide effect and so are intended for use in the
683   creation of multi-document Jobs.  These Job Template attributes have the "job-" prefix to indicate their Job wide
684   scope.  When clients supply these job-wide Job Template attributes, they MUST supply these attributes in Job
685   Creation and Validate-Job operations only.  Clients MUST NOT supply these Job Template attributes as Document

---

[12] The "job-finishings" and "job-finishings-col" Job Template attributes also include corresponding "job-finishings-ready" (1setOf type 2 enum) and "job-finishings-col-ready" (1setOf collection) attributes.

Deleted: **6/02**

686  Template attributes in the Send-Document and Send-URI operations ([ippdoc]) or in any other operations.  Clients
687  MUST NOT supply these attributes as member attributes of the "overrides" Job Template attribute [ippOverride].

## 4.1.1 job-copies (integer(1:MAX))

689  This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken
690  together.  Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
691  See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 that switches between job copies and
692  document copies depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]
693  section 4.2.4).
694  For example assume a Job has two documents.  The "copies" attribute has a value of '3' and "job-copies" has a
695  value of '2".  With "multiple-document-handling" set to 'separate-documents-collated-copies' the resulting printout
696  would have two sets (i.e. job-copies=2).  The first set would be 3 copies of Document 1 and then 3 copies of
697  Document 2.  The second set would be identical to the first.  If a similar Job was run with "multiple-documents-
698  handling" set to 'single-document-new-sheet' it would also produce two set.  In this case however each set would
699  contain Document 1, Document 2, Document 1, Document 2, Document 1, Document 2 (i.e copies=3).  The "copies"
700  and "job-copies" become more interesting when Documents within the Job each have their own value of "copies".
701  This can be accomplished via the Document object [ippdoc] or Overrides [PWG5100.4], [ippOverride].

Deleted: The "job-copies" Job Template attribute is equivalent to "copies" with "multiple-document-handling" = 'single-document-new-sheet'.   Issue to Pete: You know this stuff much better than I—would it be possible to add a small example, or a few small examples, that illustrates how "job-copies" and "copies" work, especially if they were both used at the same time?  Just an idea.

### 4.1.1.1 job-copies-default (integer(1:MAX))

703  This OPTIONAL Job Template Printer attribute specifies the default number of copies for the job as a whole.  The
704  Printer MUST support this attribute if it supports the "job-copies" Job Template attribute.

### 4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))

706  This OPTIONAL Job Template Printer attribute specifies the supported range of the number of copies for the job as a
707  whole.  The Printer MUST support this attribute if it supports the "job-copies" Job Template attribute.

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### 4.1.1.3 job-copies-actual (1setof Integer(1:MAX))

709  This OPTIONAL Job Description attribute specifies the number of copies that the Printer actually printed for the job
710  as a whole.  The Printer MAY support this attribute even if it does not support the "job-copies" Job Template attribute.

## 4.1.2 job-cover-back (collection)

712  This OPTIONAL Job Template attribute specifies the cover for the back of the job, i.e., with all of the Documents
713  taken together and is independent of the value of the "multiple-document-handling" Job Template attribute.  The
714  member attributes are the same as "cover-back" (see [pwg5100.3] section 3.1) and with the same conformance
715  requirements.  However, the "cover-back" Job Template attribute switches between a job back cover and a document
716  back cover depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section
717  4.2.4).  The "job-cover-back" Job Template attribute is equivalent to "cover-back" with "multiple-document-handling" =
718  'single-document-new-sheet'.

### 4.1.2.1 job-cover-back-default (collection)

720  This OPTIONAL Job Template Printer attribute specifies the default the cover for the back of the job.  The Printer
721  MUST support this attribute if it supports the "job-cover-back" Job Template attribute.

### 4.1.2.2 job-cover-back-supported (1setOf type2 keyword)

723  This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-cover-back"
724  Job Template collection attributes.  The Printer MUST support this attribute if it supports the "job-cover-back" Job
725  Template attribute.

726  **4.1.2.3 job-cover-back-actual (1setOf collection)**

727  This OPTIONAL Job Description attribute specifies the "job-cover-back" that the Printer actually used in producing
728  the job.  The Printer MAY support this attribute even if it does not support the "job-cover-back" Job Template
729  attribute.

## 4.1.3 job-cover-front (collection)

731  This OPTIONAL Job Template attribute specifies the cover for the front of the job, i.e., with all of the Documents
732  taken together and is independent of the value of the "multiple-document-handling" Job Template attribute.  The
733  member attributes are the same as the "cover-front" Job Template attribute (see [pwg5100.3] section 3.2) and with
734  the same conformance requirements.  However, the "cover-front" Job Template attribute switches between a job
735  front cover and a document front cover depending on the value of the "multiple-document-handling" Job Template
736  attribute ([rfc2911] section 4.2.4).  The "job-cover-front" Job Template attribute is equivalent to "cover-front" with
737  "multiple-document-handling" = 'single-document-new-sheet'.

### 4.1.3.1 job-cover-front-default (collection)

739  This OPTIONAL Job Template Printer attribute specifies the default the cover for the front of the job.  The Printer
740  MUST support this attribute if it supports the "job-cover-front" Job Template attribute.

### 4.1.3.2 job-cover-front-supported (1setOf type2 keyword)

742  This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-cover-front" Job
743  Template attributes.  The Printer MUST support this attribute if it supports the "job-cover-front" Job Template
744  collection attribute.

745  **4.1.3.3 job-cover-front-actual (1setOf collection)**

746  This OPTIONAL Job Description attribute specifies the "job-cover-front" that the Printer actually used in producing
747  the job.  The Printer MAY support this attribute even if it does not support the "job-cover-front" Job Template
748  attribute.

## 4.1.4 job-finishings (1setOf type2 enum)

750  This OPTIONAL Job Template attribute specifies the job finishings, i.e., with all of the Documents taken together.  Its
751  interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.  See the
752  "finishings" Job Template attribute defined in [rfc2911] section 4.2.6 that switches between job finishings and
753  document finishings depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]
754  section 4.2.4).  The "job-finishings" Job Template attribute is equivalent to "finishings" with "multiple-document-
755  handling" = 'single-document-new-sheet'.

### 4.1.4.1 job-finishings-default (1setOf type2 enum)

757  This OPTIONAL Job Template Printer attribute specifies the default job finishings.  The Printer MUST support this
758  attribute if it supports the "job-finishings" Job Template attribute.

### 4.1.4.2 job-finishings-ready (1setOf type2 enum)

760  This OPTIONAL Job Template Printer attribute specifies the ready job finishings, that is, the job finishings that maybe
761  used without operator intervention.  The Printer MUST support this attribute if it supports the "job-finishings" Job
762  Template attribute.

763 **4.1.4.3 job-finishings-supported (1setOf type2 enum)**

764 This OPTIONAL Job Template Printer attribute specified the supported job finishings values. The Printer MUST
765 support this attribute if it supports the "job-finishings" Job Template attribute.

766 **4.1.4.4 job-finishings-actual (1setOf type2 enum)**

767 This OPTIONAL Job Description attribute specifies the "job-finishings" that the Printer actually used in producing the
768 job. The Printer MAY support this attribute even if it does not support the "job-finishings" Job Template attribute.

769 **4.1.5 job-finishings-col (1setOf collection)**

770 This OPTIONAL Job Template attribute specifies the job finishings collection, i.e., with all of the Documents taken
771 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.
772 See the "finishings-col" Job Template attribute defined in [pwg5100.3] section 3.2 that switches between job
773 finishings collection and document finishings collection depending on the value of the "multiple-document-handling"
774 Job Template attribute ([rfc2911] section 4.2.4). The "job-finishings-col" Job Template attribute is equivalent to
775 "finishings-col" with "multiple-document-handling" = 'single-document-new-sheet'.

776 **4.1.5.1 job-finishings-col-default (collection)**

777 This OPTIONAL Job Template Printer attribute specifies the default job finishings collection. The Printer MUST
778 support this attribute if it supports the "job-finishings-col" Job Template attribute.

779 **4.1.5.2 job-finishings-col-ready (collection)**

780 This OPTIONAL Job Template Printer attribute specifies the ready job finishings collection, that is, the job finishings
781 collection that maybe used without operator intervention. The Printer MUST support this attribute if it supports the
782 "job-finishings-col" Job Template attribute.

783 **4.1.5.3 job-finishings-col-supported (1setOf type2 keyword)**

784 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-finishings-col"
785 Job Template collection attribute. The Printer MUST support this attribute if it supports the "job-finishings-col" Job
786 Template attribute.

787 **4.1.5.4 job-finishings-col-actual (1setOf collection)**

788 This OPTIONAL Job Description attribute specifies the "job-finishings-col" attributes that the Printer actually used in
789 producing the job. The Printer MAY support this attribute even if it does not support the "job- finishings-col " Job
790 Template attribute.

791 **4.2 Job Template attributes that may have Document Scope and Override Scope**

792 This section defines additional Job Template attributes that are *not* restricted to job-wide scope and MAY be supplied
793 in Document Creation operations and in the "override" attribute to override at the Sheet level (see section 8). When
794 supplied in a Document Creation operation, these Job Template attributes describes the Document explicitly. This
795 specification does *not* define corresponding Document Description attributes, since this specification does not include
796 or depend on a Document object[13].

---

[13] For Document Description attributes that correspond to the Operation attributes defined for Document Creation
operations, see the Document object defined in [ippdoc].

### 4.2.1 output-device (name(127))

This OPTIONAL Job Template attribute specifies the name of the target output device for a Printer that fans-out to multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects. If this Job Template attribute is omitted, the Printer selects whichever output device seems best for the job in an implementation dependent manner.

ISSUE 01: The [rfc2911] Job Description attribute "output-device-assigned" is single-valued even though the "output-device" Job Template can be supplied at the Job, Document and page Override (i.e. Sheet) level. Proposed resolution: Leave the Job Description attribute single-valued. This will prevent any interoperability problems with existing implementations. It will also handle the majority of uses. Add a single-valued "output-device" Job Template attribute which MAY be supplied in a Document Creation operation to give it Document scope and in the "overrides" attribute to give it Sheet scope... Implementations that allow the routing of individual sheets should be capable of implementing "overrided" and "-actuals". Even if they don't support -actuals, the "overrides" Template attribute will contain the requested output devices.

#### 4.2.1.1 Why there is no output-device-default

There is no "output-device-default" Printer attribute. A Printer MAY have a dynamic scheduling algorithm to assign jobs to output devices, in which case the "output-device-supported" Printer attribute would have multiple values. A client that did not supply an explicit "output-device" is asking the Printer to choose the most appropriate output device(s) (i.e. physical printer(s)) to print the Job. If "output-device-default" was allowed there would be no way to request this since the default output device would be assigned when it was not supplied by the client. If the Printer does not have a dynamic scheduling algorithm to assign Jobs to output devices, the Printer would populate "output-device-supported" with only one value.

#### 4.2.1.2 output-device-ready (1setOf name(127))

This OPTIONAL Job Template Printer attribute specifies the output devices that are available for use without human operator intervention, i.e., are accepting jobs and are not in need of attention. The Printer MAY support this attribute if it supports the "output-device" Job Template attribute.

ISSUE: 02 - OK to define "output-device-ready" Job Template Printer attribute?

#### 4.2.1.3 output-device-supported (1setOf name(127))

This OPTIONAL Job Template Printer attribute specifies the supported "output-device" values. The Printer MUST support this attribute if it supports the "output-device" Job Template attribute.

#### 4.2.1.4 output-device-actual (1setOf name(127))

This OPTIONAL Job Description attribute specifies the output-device(s) that the Printer actually used to produce the job [ippact]. The Printer MAY support this Job Description attribute even if it does not support the "output-device " Job Template attribute. Note: The "output-device-actual" attribute MAY have more than one value, while the [rfc2911] "output-device-assigned" Job Description attribute has only a single name(127) value.

### 4.2.2    print-content-optimize (type2 keyword)

This OPTIONAL Job DescriptionTemplate attribute refines the value specified by the "print-quality" ([rfc2911] §4.2.13) attribute. The "print-quality" attribute the level of quality. The "print-content-optimize" attribute directs the type of optimization/processing that will be performed on the Document content. It does not necessarily mean the value describes the content.

The standard keyword values are:

- 'photo': optimize for photographic clarity
- 'graphic': optimize for graphic clarity such as grapgs and line drawings
- 'text': optimize for text clarity
- 'text-and-graphic': optimize for both text and graphic clarity

#### 4.2.2.1 print-content-optimize-default (type2 keyword)

This OPTIONAL Job Template Printer attribute specifies the default "print-content-optimize" value. The Printer MUST support this attribute if it supports the "output-device" Job Template attribute.

#### 4.2.2.2 print-content-optimize-supported(1setOf type2 keyword)

This OPTIONAL Job Template Printer attribute specifies the supported "print-content-optimize" values. The Printer MUST support this attribute if it supports the "output-device" Job Template attribute.

#### 4.2.2.3 print-content-optimize-actual (1setOf type2 keyword)

This OPTIONAL Job Description attribute specifies the "print-content-optimize "(s) that the Printer actually used to produce the job [ippact]. The Printer MAY support this Job Description attribute even if it does not support the " print-content-optimize " Job Template attribute. Note: The "print-content-optimize -actual" attribute MAY have more than one value, while the "print-content-optimize" Job Description attribute has only a single value.

## 5   Job Description attributes

This section defines the new Job Description attributes defined in this IPP specification. Job Description attributes are Job object attributes that are filled in by the Printer. Some Job Description attribute values are supplied by the client in the Job operation using corresponding Operation attributes as indicated in the "Set by" column. The Printer MUST NOT support modification of any of these Job Description attributes using the Set-Job-Attributes operation ([rfc3380]).

This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s) in the Job[14]. The following legend is used in the tables in both sections:

| **Legend**: | |
|---|---|
| **IPP Attribute Syntax** | the attribute syntax (see [rfc2911] section 4.1). |
| **Set by** | indicates whether the value is set by the client or Printer in the Job Creation operation: **client** - means that the Printer MUST populate this Job Description attribute by copying *from* the corresponding Operation attribute that the client MAY supply in the Job Creation operation.  See Table 5 for the corresponding Operation attribute. **Printer** - means that the Printer sets the value based on the state of the Printer. |
| **Printer conformance** | indicates MUST or MAY for Printer conformance. |
| **Reference** | references either to a sub-section of this specification or to a section in another specification, where further information about this attributes can be found. |

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[14] The [jobx] specification does not define any Document Description attributes.  See the [ippdoc] specification.

## 5.1 Job Description attributes that describe the Job as a whole

864 This section defines those Job Description attributes that describe the Job as a whole.  See section 5.2 below for
865 those Job Description attributes that are defaults for the Document or Documents in the Job.

866                              **Table 8 - Job Description attributes that describe the Job as a whole**

| Job Description attribute name | IPP Attribute Syntax | Set by | Printer conformance | Reference |
|---|---|---|---|---|
| **errors-count** | integer(0:MAX) | Printer | MAY | §5.1.1 |
| **ipp-attribute-fidelity** | boolean | client | MAY | §5.1.2 |
| **job-mandatory-attributes** | 1setOf type2 keyword | client | MAY | §5.1.3 |
| **output-device-assigned** | name(127) | Printer | MAY | [rfc2911] §4.3.7.2 |
| **warnings-count** | integer(0:MAX) | Printer | MAY | §5.1.4 |

867
868 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
869 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
870 Document).  Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing,
871 and formatting processes as well.  The job state reasons have a number of reasons that are print service specific, but
872 most can apply to other types of service as well.  The reason for separating state from reasons is so that the states
873 can be the fundamental states that most implementations have, while the state reasons can vary depending on the
874 sophistication of the system.  The states are the ones that clients are most likely to base actions upon, and the state
875 reasons are more information, both for programs and people.

### 5.1.1  errors-count (integer(0:MAX))

877 This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole.
878 An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the
879 Printer's font or an image in a page was in a format that the Printer didn't support, though the Printer did support the
880 overall document format.

### 5.1.2 ipp-attribute-fidelity (boolean)

882 This OPTIONAL Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation
883 attribute ([rfc2911] section 3.2.1.1)[15] that the client supplied in the Job Creation operation.  This Job Description
884 attribute has no effect on the processing of the job once the Job Creation operation has been accepted[16].  However,
885 this attribute does provide an audit capability to the user and service desk for comparing unexpected printed results
886 with what was submitted.

### 5.1.3 job-mandatory-attributes (1setOf type2 keyword)

888 This OPTIONAL Job Description attribute indicates which Job Template attributes that the client required that the
889 Printer Support in order to accept the Job Creation request.  The Printer populates this attribute with the value of the
890 corresponding "job-mandatory-attributes" Operation attribute (see section 3.1.2) supplied by the client in the Job
891 Creation operation.  This Job Description attribute has no effect on the processing of the job once the Job Creation
892 operation has been accepted[16].  However, this Job Description attribute does provide an audit capability of the Job

---

[15] The "ipp-attribute-fidelity" attribute is defined only as an Operation attribute in [rfc2911].  This specification is
defining it as a Job Description attribute as well which the Printer MAY support.
[16] The "ipp-attribute-fidelity" and "job-mandatory-attributes" Operation attributes do have effect after the Job Creation
operation when the Document Object is supported [ippdoc].

893  object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for comparing unexpected
894  printed results with what was submitted.  See section  3.1.2 for additional details of the semantics of this "job-
895  mandatory-attributes" Operation attribute that are not repeated here.

### 5.1.4 warnings-count (integer(0:MAX))

897  This OPTIONAL Job Description attribute counts the number of warnings encountered processing the job as a whole.
898  A warning is where no information is lost, but the appearance of the printed output MAY not be as expected.

## 5.2 Job Description attributes that are defaults for the Document(s) in the Job

900  This section defines those Job Description attributes that provide defaults for the Document Or Documents in the
901  Job.  See section 5.1 above for those Job Description attributes that describe the Job as a whole.

### 5.2.1 compression-supplied (type3 keyword)

903  This REQUIRED Job Description attribute specifies the *default* compression used to represent the document(s) in
904  the Job.  The Printer sets this Job Description attribute from the corresponding Operation attribute (see [rfc2911]
905  §3.2.1.1) supplied by the client in the Job Creation operation.

### 5.2.2 document-charset-supplied (charset)

907  This OPTIONAL Job Description attribute specifies the *default* charset used to represent this document (see section
908  3.2.2).  The Printer sets this Job Description attribute from the corresponding Operation attribute supplied by the
909  client in the Job Creation operation.

### 5.2.3 document-digital-signature-supplied (type2 keyword)

911  This OPTIONAL Job attribute specifies the *default* digital signature technology used in the Document content.  The
912  Printer sets this Job Description attribute from the corresponding "document-digital-signature" Operation attribute
913  (see section 3.2.3 for the semantics), if supplied by the client in the Job Creation operation.  If a Printer supports the
914  "document-digital-signature" Operation attribute, the Printer MUST support this "document-digital-signature" Job
915  Description attribute.

### 5.2.4 document-format-details-supplied (1setOf collection)

917  This OPTIONAL Job Description attribute specifies the *default* details of the document format(s) of the Document
918  Object content.  The Printer sets this Job Description attribute from the corresponding "document-format-details"
919  Operation attribute (see section 3.2.5 for the semantics), if supplied by the client in the Job Creation operation.  If a
920  Printer supports the "document-format-details" Operation attribute, the Printer MUST support this "document-format-
921  details" Job Description attribute.

### 5.2.5 document-format-supplied (mimeMediaType)

923  This REQUIRED[18] Job Description attribute specified the *default* document format of the Document Object content.
924  The Printer sets this Job Description attribute from the corresponding "document-format" Operation attribute (see

---

[18] [rfc2911] did not define a "document-format" Document Description attribute; it is a new attribute defined in this
specification.

925		[rfc2911] section 3.2.1.1 and [this spec] section 3.2.4 for the semantics), if supplied by the client in the Job Creation
926		operation.

## 5.2.6 document-format-version-supplied (text(127))

928		This OPTIONAL Job Description attribute specifies the *default* version of the document format of the Document
929		Object content.  The Printer sets this Job Description attribute from the corresponding "document-format-version"
930		Operation attribute (see section 3.2.6 for the semantics), if supplied by the client in the Job Creation operation (see
931		section ).  If a Printer supports the "document-format-version" Operation attribute, the Printer MUST support this
932		"document-format-version" Job Description attribute.

## 5.2.7 document-message-supplied (text(MAX))

934		This OPTIONAL Job Description contains either (1) the *default* message from the user to the operator about the
935		Document(s) or (2) a message from the operator, system administrator, or "intelligent" process to indicate to the end
936		user the reasons for modification or other management action taken on the Document.  The Printer populates this
937		Job Description attribute from the "document-message" (text(MAX) Operation attribute value (see section 3.2.7)
938		supplied by the client in the Job Creation operation.

939		In addition, the user and the operator can set the value of this Job Description attribute explicitly using the Set-Job-
940		Attributes operation (see [rfc3380]).

## 5.2.8 document-name-supplied (name (MAX))

942		This REQUIRED Job Description attribute specifies the *default* name of the document (see [rfc2911] §3.2.1.1).  The
943		Printer sets this Job Description attribute from the corresponding Operation attribute (see section 3.2.8) supplied by
944		the client in the Job Creation operation.

## 5.2.9 document-natural-language-supplied (naturalLanguage)

946		This OPTIONAL Job Description attribute specifies the *default* primary natural language of the Document content
947		(see [rfc2911] section 3.2.1.1).  The Printer sets this Job Description attribute from the corresponding Operation
948		attribute (see section 3.2.9) supplied by the client in the Job Creation operation.

# 6   New values to existing attributes

950		This section defines new values for existing attributes.

## 6.1 New job-state-reasons(1setOf type2 keyword) Values

952		The REQUIRED "job-state-reasons" Job Description attributes ([rfc2911] section 4.3.8) provide additional information
953		about the job's current state, i.e., information that augments the value of the job's "job-state" attribute.

954		These new values MAY be used with any job state for which the reason makes sense.  When implemented, the
955		Printer MUST return these values when the reason applies and MUST NOT return them when the reason no longer
956		applies whether the value of the Job's "job-state" attribute changed or not.  When the Job does not have any reasons
957		for being in its current state, the value of the Job's "job-state-reasons" attribute MUST be 'none'.

958		Note: While values cannot be added to the "job-state" attributes without impacting deployed clients that take actions
959		upon receiving "job-state" values, it is the intent that additional "job-state-reasons" values can be defined and

960 registered without impacting such deployed clients. In other words, the "job-state-reasons" attribute are intended to
961 be extensible.

962 Table 9 lists the new keyword values for the "job-state-reasons" attribute defined in this specification as indicated in
963 the References column. In Table 9 the keywords are listed in alphabetic order, while in their descriptions following
964 Table 9, they are listed in the most likely order of occurrence to help understanding.

965 **Table 9 - New "job-state-reasons" attribute values**

| IPP Job Description attribute name | IPP Attribute Syntax plus Values | Printer conformance | Reference |
|---|---|---|---|
| **job-state-reasons** | 1setOf type2 keyword | MUST | [rfc2911] §4.3.8 |
| | digital-signature-did-not-verify | MAY | [this spec] §6.1 |
| | digital-signature-type-not-supported | MAY | [this spec] §6.1 |
| | errors-detected | MAY | [this spec] §6.1 |
| | job-digital-signature-wait | MAY | [this spec] §6.1 |
| | warnings-detected | MAY | [this spec] §6.1 |

966
967 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
968 to occur (if implemented):

969 **'digital-signature-type-not-supported'**: One or more documents in the Job contain a digital signature type
970      that is not supported. Implementation or site policy determines the state of the Job once this
971      condition is detected.

972 **'job-digital-signature-wait'**: The Job is currently being held because the Job was submitted with a
973      "document-digital-signature" attribute value that is not supported.

974 **'digital-signature-did-not-verify'**: One or more documents in the Job contains a digital signature type that is
975      supported (see section 3.2.3), but the signature did not verify when the Printer attempted to verify the
976      signature.

977 **'errors-detected'** : If the Printer supports this value, the Printer MUST add this value to "job-state-reasons"
978      when the Printer generates the first error message. That is, a single occurrence of this value is
979      present in the "job-state-reasons" Job Description attribute if the Printer has generated one or more
980      errors. An error indicates loss of information, such as a page not imaged. See also the 'warnings-
981      detected' value.

982 **'warnings-detected'** : If the Printer supports this value, the Printer MUST add this value to "job-state-
983      reasons" when the Printer generates the first warning message. That is, a single occurrence of this
984      value is present in the "job-state-reasons" Job Description attribute if the Printer has generated one
985      or more warnings. A warning indicates something did not go as expected, but there was no loss of
986      information. For example, a font substitution. See also the 'errors-detected' value.

987 ## 6.2 New media (type 3 keyword | name(MAX)) Values

988 This section specifies one new value for the "media" Job Template attribute:

989 **'choice_iso_a4_210x297mm_na_letter_8.5x11in'**: The client has explicitly allowed a choice of media for
990      the Job. The Printer MUST choose physical media of size na_letter_8.5x11in (215.9 x 279.4 mm) or
991      iso_a4_210x297mm. The Printer MUST NOT choose physical media of any other size. The Printer
992      MAY scale the image to fit, but any scaling MUST be isomorphic scaling and without image content
993      loss, or overflow to additional sheets (so-called tiling), or truncate (and MUST notify the sending user

994  and receiving user by implementation means if truncation is performed, since that is loss of
995  information).

996  **Rationale:** If printing by reference, the size of the document isn't known by the submitter.

997  See Annex A (section 18) for additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate
998  Standard [pwg5101.1] to include the new **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** and other choice
999  values.


# 7 New Printer Description attributes

1001  This section lists *the new* Printer Description attributes defined in this document.  These Printer attributes are "xxx-
1002  supported" and "xxx-default" Printer attributes which indicate the default and supported values that the Printer
1003  supports..  The Printer MUST support these Printers attributes if the Printer supports the corresponding "xxx"
1004  Operation attributes (see section 3) that the client can supply in a Job Creation or Document Creation request.
1005
1006  The column labels are:

| Column Heading | |
|---|---|
| "**Attribute Syntax**" | the attribute syntax (see [rfc2911] section 4.1).  Many "xxx-default" and "xxx-supported" attributes have the 'collection' syntax which consists of a number of member attributes.  These member attributes are not listed in this table when they are the same as the corresponding "xxx" attribute in Table 7.  Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table. |
| | |
| "**Reference**" | the section which defines the semantics of the attribute. |

1007

1008  **Table 10 - New Printer Description attributes**

| Printer **Description** attribute name | Attribute Syntax | Reference |
|---|---|---|
| **document-charset-default** | charset | [this-spec] §7.1 |
| **document-charset-supported** | 1setOf charset | [this-spec] §7.2 |
| **document-digital-signature-default** | type2 keyword | [this-spec] §7.3 |
| **document-digital-signature-supported** | 1setOf type2 keyword | [this-spec] §7.4 |
| **document-format-details-default** | collection | [this-spec] §7.5 |
| **document-format-details-supported** | 1setOf type2 keyword | [this-spec] §7.6 |
| **document-format-version-default** | text(127) | [this-spec] §7.7 |
| **document-format-version-supported** | 1setOf text(127) | [this-spec] §7.8 |
| **document-natural-language-default** | naturalLanguage | [this-spec] §7.9 |
| **document-natural-language-supported** | 1setOf naturalLanguage | [this-spec] §7.10 |
| | | |

1009

## 7.1 document-charset-default (charset)

1011  This OPTIONAL Printer Description attribute indicates the default charset that the Printer will assume for charset-
1012  ambiguous document formats when the client omits the "document-charset" Operation attribute (section 3.2.2).  The
1013  Printer MUST support this attribute if it supports the corresponding "document-charset" Operation attribute (see
1014  section 3.2.2)

1015    **7.2 document-charset-supported (1setOf charset)**

1016    This OPTIONAL Printer Description attribute indicates the charsets that the Printer supports in Document Content,
1017    that is, supports as values of the "document-charset" Operation attribute (section 3.2.2). The Printer MUST support
1018    this attribute if it supports the corresponding "document-charset" Operation attribute (see section 3.2.2).

1019    **7.3 document-digital-signature-default (type2 keyword)**

1020    This OPTIONAL Printer Description attribute indicates the default digital signature, if any, that the Printer will assume
1021    when the client omits the "document-digital-signature" Operation attribute (section 3.2.3). The Printer MUST support
1022    this attribute if it supports the "document-digital-signature" Operation attribute.

1023    **7.4 document-digital-signature-supported (1setOf type2 keyword)**

1024    This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in
1025    Document Contents, that is, supports as values of the "document-digital-signature" Operation attribute (section
1026    3.2.3). The Printer MUST support this attribute if it supports the "document-digital-signature" Operation attribute.

1027    **7.5 document-format-details-default (collection)**

1028    This OPTIONAL Printer Description attribute indicates the default document format details that the Printer will
1029    assume when the client omits the "document-format-details" Operation attribute (section §3.2.5). The member
1030    attributes are the same as "document-format-details" (see section 3.2.5). The Printer MUST support this attribute, if it
1031    supports the "document-format-details" Operation attribute (see section 3.2.5).

1032    **7.6 document-format-details-supported (1setOf type2 keyword)**

1033    This OPTIONAL Printer Description attribute lists the type2 keyword names of the member attributes of "document-
1034    format-details" that the Printer supports. The Printer MUST support this "document-format-details" (1setOf type2
1035    keyword) Printer Description attribute, if the Printer supports the "document-format-details" (1setOf collection)
1036    Operation attribute (see section 3.2.5). Table 11 lists the type2 keywords defined for use in the "document-format-
1037    details-supported" Printer attribute.

1038                   **Table 11 - Keyword values of "document-format-details-supported Printer attribute**

| Type2 keyword values | Printer conformance |
|---|---|
| document-source-application-name | MAY |
| document-source-application-version | MAY |
| document-source-os-name | MAY |
| document-source-os-version | MAY |
| document-format | MUST |
| document-format-device-id | MAY |
| document-format-version | MUST |
| document-natural-language | MAY |

1039

## 7.7 document-format-version-default (text(127))

This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will assume when the client omits the "document-format-version" Operation attribute (section 3.2.6). The Printer MUST support this attribute if it supports the "document-format-version" Operation attribute.

## 7.8 document-format-version-supported (1setOf text(127))

This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for Document Contents, that is, supports as values of the "document-format-version" Operation attribute (section 3.2.6). The Printer MUST support this attribute if it supports the "document-format-version" Operation attribute.

## 7.9 document-natural-language-default (naturalLanguage)

This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will assume for Document Content when the client omits the "document-natural-language" Operation attribute ([rfc2911] section 3.2.1.1). The Printer MUST support this attribute if it supports the "document-natural-language" Operation attribute.

## 7.10 document-natural-language-supported (1setOf naturalLanguage)

This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the "document-natural-language" Operation attribute ([rfc2911] section 3.2.1.1).

## 8   Override Scope of Attributes

This section defines the Override Scope of the Job Template attributes. An Override Scope is only applicable when the Job Template attribute is applied as part of an Override [ippOverride]. An Override allows specifying Job Template attributes that apply to a portion of a Job. The portion of the Job that an Override can apply is referred to as its Scope. A Scope is the smallest entity to which a Job Template attribute applies. The order of Scopes is: a Job contains one or more Documents that are printed on one or more Sheets that have up to two Impressions containing one or more Pages. For a Printer to support a Job Template attribute in an Override, it MUST support the Job Template at the specified Scope. Furthermore the scope of the attribute MUST be 'Sheet', Impression' or 'Page'. Although operation attributes can not be used in an Override, their scope is of interest to determine their applicability in "Send-Document" and "Send-Uri". The various possible scopes of Operation and Job Template attributes are:

**Job**           Job Template Attributes that operate on whole Jobs are not applicable as page overrides.
**Document**        Job Template Attributes that operate on whole Documents are not applicable as page overrides. (The Document operations "Send-Document" and Send-Uri" as well as the Document Object [ippdoc] are used to apply overrides at this level.)
**Sheet**          Job Template Attributes that operate on whole Sheets, such as "media" and "finishings". Attributes with this scope MAY be included in "overrides".
**Impression**    Job Template Attributes that operate on whole Impressions, such as "number-up" or "x-side1-image-shift". Attributes with this scope MAY be included in "overrides".
**Page**          Job Template Attributes that operate on whole Pages, such as "orientation-requested" or "print-quality". Attributes with this scope MAY be included in "overrides".

1078 ## 8.1 Override Scope of Job Template attributes

1079 By definition only the "output-device" and "print-content-optimize" attributes from this specification can be used in an
1080 Override.

1081 **Table 12  Override Scope for Job Template Attributes**

| Attribute Name | Override Scope |
|---|---|
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|  |  |
| job-cover-back | Job |
| job-cover-front | Job |
| job-finishings | Job |
| job-finishings-col | Job |
| job-mandatory-attributes | Job |
| output-device | Sheet |
|  |  |
| print-content-optimize | Page |

1082

1083 ## 8.2 Scope for Operation attributes

1084 Although, by definition, Operation attributes do not have an Override Scope, their Scope is applicable since the
1085 attribute may be supplied as an Operation attribute in the Send-Document or Send-URI operations. In these cases,
1086 the Operation attribute overrides the corresponding value supplied at the Job Level in the Create-Job operation.
1087 Table 13 shows the pseudo "Override Scope" of the Operation attributes referenced in this specification. Note that
1088 although these attributes may be used with a Document they can not be used as Overrides.

1089                                        **Table 13  Scope for Operation Attributes**

| Attribute Name | Scope |
|---|---|
| compression-supplied | Document |
| document-charset | Document |
| document-digital-signature | Document |
| document-format-details | Document |
| document-format-version | Document |
| document-format-natural-language | Document |
| document-message | Document |
| document-name | Document |
| document-natural-language | Document |
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1090

# 1091  9   Conformance Requirements

1092  This specification contains a number of independent OPTIONAL attributes.  This section summarizes the
1093  conformance requirements for Printers and clients.

## 1094  9.1 Printer conformance requirements

1095  In order to claim conformance to this specification,

1096  1.   A Vendor MUST explicitly identify the attributes and values supported by the Printer implementation in
1097       any such claim of conformance.  In addition, the Vendor's Printer implementation:

1098  2.   MUST meet the conformance requirements for Printers specified in [rfc2911].

1099  3.   MUST support one or more OPTIONAL Operation attribute according to section 3 and the corresponding
1100      Job Description attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & and
1101      combine with #3

1102  4.   MAY support any Job Template attribute according to section 1.

1103  5.   MAY support any of the "job-state-reasons" values according to section 6.

## 9.2 Client conformance requirements

1104

1105    In order to claim conformance to this specification,

1106    1. A Vendor MUST explicitly identify the attributes and values supported by the client implementation in any
1107        such claim of conformance.  In addition, the Vendor's client:

1108    2. MUST meet the conformance requirements for clients specified in [rfc2911]

1109    3. MUST support at least one Operation attribute according to section 3 and the corresponding Job Description
1110        attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & combine with #3

1111    4. MAY support any Job Template attribute according to section 1.

## 10  Normative References

1112

1113    [dcs2.0]
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1115        http://www.npes.org/standards/Tools/DCS20Spec.pdf

1116    [dss]
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1118        Standards Publication 186-1 (FIPS PUB 186-1), December 15, 1998.

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1120        Hastings, T., and P. Zehler, "Internet Printing Protocol (IPP): Document Object", October 14, 2002,
1121        ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc10-20030519.doc, .pdf, .rtf  <work in progress>

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1123        Zehler, P., Herriot, R., and K. Ocke,  "Internet Printing Protocol (IPP): Page Overrides", May 27, 2003,
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1125    [ippjobx] - this specification
1126        Hastings, T., and P. Zehler, "Internet Printing Protocol (IPP): Job Extensions", May 30, 2003,
1127        ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030530.doc, .pdf, .rtf,  <work in progress>.

1128    [iso12639]
1129        ISO 12639:1998 Graphic technology -- Prepress digital data exchange -- Tag image file format for image
1130        technology (TIFF/IT), 1998.

1131    [iso15930]
1132        ISO 15930-1:2001 Graphic technology -- Prepress digital data exchange -- Use of PDF -- Part 1: Complete
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1140        by (1) a new Page Overrides specification which removes the "document-overrides" Job Template attribute
1141        and Operation attribute in favor of using the Document Object [ippdoc] and (2)  a clarified definition of
1142        "pages-per-subset" Job Template attribute [ippfutures].

1143    [pwg5100.3]
1144        Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", IEEE-ISTO
1145        5100.3-2001, February 12, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf.

1146    [rfc1991]
1147        D. Atkins, W. Stallings, P. Zimmermann, "PGP Message Exchange Formats", RFC 1991, August, 1996.

1148    [rfc2046]
1149        Freed, N., and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC
1150        2046, November 1996.

1151    [rfc2634]
1152        P. Hoffman, "Enhanced Security Services for S/MIME", RFC 2634, June 1999.

1153    [rfc2854]
1154        Connolly, D., and L. Masinter, "The 'text/html' Media Type", RFC 2854, June 2000.

1155    [rfc2911]
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1158    [rfc3380]
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1169    # 11 Informative References

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1172    [ippact]
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1174            January 31, 2003, ftp://ftp.pwg.org/pub/pwg/ipp/new_ACT/pwg-ipp-actual-attrs-v04-030131.pdf


1175    [ippfax]
1176            Moore, P., Songer, G., Hastings, T., McDonald, Pulera, and M. Joel, "IPP FAX Protocol", July 26, 2001,
1177            ftp://ftp.pwg.org/pub/pwg/QUALDOCS/pwg-ifx-ippfax-P16-030423.pdf.


1178    [ippfutures]
1179            Work in progress to contain attributes not needed immediately.  No draft is currently available.


1180    [pwg-psi]
1181            "Print Service Interface (PSI)", work in progress to become a PWG IEEE-ISTO standard.  Visit
1182            http://www.pwg.org/.


1183    [pwg-sm]
1184            Zehler, P., and S. Albright, "PWG Semantic Model", work in progress to become a PWG IEEE-ISTO standard,
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1193            Wright, D., "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999.


1194    [rfc2568]
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1199            1999.


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1202            Guide", RFC 3196, November 2001.


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## 12 IANA Considerations

This section contains the registration information for IANA to add to the various IPP Registries according to the procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document.  The resulting registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

*Note to the PWG Editor:  Replace the References below to [this spec]  with the IEEE-ISTO standard number for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

## 12.1 Attribute Registrations

The following table lists all the attributes defined in this specification.  These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.2.  If the attribute has a separate sub-section definition in this specification, that sub-section is listed as the Reference.  This table contains the reference to another specification that completely defines each attribute.

```
Attribute Name (attribute syntax)              Reference    Section
---------------------------------              ----------   -------

Job Description attributes:
compression-supplied (type3 keyword)           [this spec]  5.2.1
document-charset-supplied (charset)            [this spec]  5.2.2
document-digital-signature-supplied (type2 keyword)
                                               [this spec]  5.2.3
document-format-details-supplied (1setOf collection)
                                               [this spec]  5.2.4
  document-source-application-name (name(MAX)) [this spec]  5.2.4
  document-source-application-version (text(127))
                                               [this spec]  5.2.4
  document-source-os-name (name(40))           [this spec]  5.2.4
  document-source-os-version (text(40))        [this spec]  5.2.4
  document-format (mimeMediaType)              [this spec]  5.2.4
  document-format-device-id (text(127))        [this spec]  5.2.4
  document-format-version (text(127)           [this spec]  5.2.4
  document-natural-language (1setOf naturalLanguage)
                                               [this spec]  5.2.4
document-format-supplied (mimeMediaType)       [this spec]  5.2.5
document-format-version-supplied (text(127))   [this spec]  5.2.6
document-message-supplied (text(MAX))          [this spec]  5.2.7
document-name-supplied (name(MAX))             [this spec]  5.2.8
document-natural-language-supplied (naturalLanguage)
                                               [this spec]  5.2.9
errors-count (integer(0:MAX))                  [this spec]  5.1.1
job-attribute-fidelity (boolean)               [this spec]  5.1.2
job-mandatory-attributes (1setOf type2 keyword) [this spec] 5.1.3
warnings-count (integer(0:MAX))                [this spec]  5.1.4

Job Template attributes:
```

```
1250   job-copies (integer(1:MAX))                         [this spec]   4.1.1
1251   job-copies-default (integer(1:MAX))                 [this spec]   4.1.1.1
1252   job-copies-supported (rangeOfInteger(1:MAX))        [this spec]   4.1.1.2
1253   job-copies-actual (1setOf Integer(1:MAX))           [this spec]   4.1.1.3
1254   job-cover-back (collection)                         [this spec]   4.1.2
1255     <member attributes are the same as "cover-back"[pwg5100.3]   3.1>
1256   job-cover-back-default (collection)                 [this spec]   4.1.2.1
1257     <member attributes are the same as "cover-back"[pwg5100.3]   3.1>
1258   job-cover-back-supported (1setOf type2 keyword)     [this spec]   4.1.2.2
1259   job-cover-back-actual (1setOf collection)           [this spec]   4.1.2.3
1260     <member attributes are the same as "cover-back"[pwg5100.3]   3.1>
1261   job-cover-front (collection)                        [this spec]
1262   4.1.34.1.2.3
1263     <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1264   job-cover-front-default (collection)                [this spec]   4.1.3.1
1265     <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1266   job-cover-front-supported (1setOf type2 keyword) [this spec]   4.1.3.2
1267   job-cover-front (1setOf collection)                 [this spec]   4.1.3.3
1268     <member attributes are the same as "cover-front"[pwg5100.3] 3.1>
1269   job-finishings (1setOf type2 enum)                  [this spec]   4.1.4
1270   job-finishings-default (1setOf type2 enum)          [this spec]   4.1.4.1
1271   job-finishings-ready (1setOf type2 enum)            [this spec]   4.1.4.2
1272   job-finishings-supported (1setOf type2 keyword)     [this spec]   4.1.4.3
1273   job-finishings-actual (1setOf type2 enum)           [this spec]   4.1.4.4
1274   job-finishings-col (1setOf collection)              [this spec]   4.1.5
1275     <member attributes are the same as "finishings-col"[pwg5100.3] 3.2>
1276   job-finishings-col-default (1setOf type2 enum)      [this spec]   4.1.5.1
1277   job-finishings-col-ready (1setOf type2 enum)        [this spec]   4.1.5.2
1278   job-finishings-col-supported (1setOf type2 keyword)
1279                                                       [this spec]   4.1.5.3
1280   job-finishings-col-actual (1setOf collection)       [this spec]   4.1.5.4
1281     <member attributes are the same as "finishings-col"[pwg5100.3] 3.2>
1282   output-device (name(127))                           [this spec]   4.2.1
1283   output-device-ready (1setOf name(127))              [this spec]   4.2.1.2
1284   output-device-supported (1setOf name(127))          [this spec]   4.2.1.3
1285   output-device-actual (1setOf name(127))             [this spec]   4.2.1.4
1286   print-content-optimize (type2 keyword)              [this spec]   4.2.2
1287   print-content-optimize-default (type2 keyword)      [this spec]   4.2.2.1
1288   print-content-optimize-supported (1setOf type2 keyword)
1289                                                       [this spec]   4.2.2.2
1290   print-content-optimize-actual (1setOf type2 keyword)
1291                                                       [this spec]   4.2.2.3
1292
1293   Printer Description attributes:
1294   document-charset-default (charset)                  [this spec]   7.1
1295   document-charset-supported (1setOf charset)         [this spec]   7.2
```

```
1296  document-digital-signature-default (type2 keyword)    [this spec]  7.3
1297  document-digital-signature-supported (1setOf type2 keyword)
1298                                          [this spec]  7.4
1299  document-format-details-default (collection)        [this spec]  7.5
1300    <member attributes are the same as "document-format-details"
1301                                          [this spec] 3.2.5>
1302  document-format-details-supported (1setOf type2 keyword)
1303                                          [this spec]  7.6
1304  document-format-version-default (text(127))         [this spec]  7.7
1305  document-format-version-supported (1setOf text(127))  [this spec]  7.8
1306  document-natural-language-default (naturalLanguage)   [this spec]  7.9
1307  document-natural-language-supported (1setOf naturalLanguage)
1308                                          [this spec]  7.10
1309
1310  Operation attributes:
1311  document-charset (charset)                   [this spec]   3.2.2
1312  document-digital-signature (type2 keyword)        [this spec]   3.2.3
1313  document-format-details (1setOf collection)       [this spec]   3.2.5
1314    document-source-application-name (name(MAX))     [this spec]   3.2.5.1
1315    document-source-application-version (text(127))
1316                                          [this spec]   3.2.5.2
1317    document-source-os-name (name(40))         [this spec]   3.2.5.3
1318    document-source-os-version (text(40))       [this spec]   3.2.5.4
1319    document-format (mimeMediaType)            [this spec]   3.2.5.5
1320    document-format-device-id (text(127))       [this spec]   3.2.5.6
1321    document-format-version (text(127)           [this spec]   3.2.5.7
1322    document-natural-language (1setOf naturalLanguage)
1323                                          [this spec]   3.2.5.8
1324  document-format-version (text(127))          [this spec]   3.2.6
1325  document-natural-language (naturalLanguage)       [this spec]   3.2.9
1326  job-mandatory-attributes (1setOf type2 keyword)  [this spec]   3.1.2
```

## 12.2 Keyword attribute values

```
1328  document-digital-signature (type2 keyword)        [this spec]   3.2.3
1329  document-digital-signature-default (type2 keyword)
1330                                          [this spec]   7.3
1331  document-digital-signature-supported (1setOf type2 keyword)
1332                                          [this spec]   7.4
1333    dss                                    [this spec]   3.2.3
1334    none                                   [this spec]   3.2.3
1335    pgp                                    [this spec]   3.2.3
1336    smime                                  [this spec]   3.2.3
1337    xmldsig                                [this spec]   3.2.3
1338
1339  document-format-details-supported (1setOf type2 keyword)
1340                                          [this spec]   7.6
```

```
1341    document-source-application-name        [this spec]   7.6
1342    document-source-application-version     [this spec]   7.6
1343    document-source-os-name                 [this spec]   7.6
1344    document-source-os-version              [this spec]   7.6
1345    document-format                         [this spec]   7.6
1346    document-format-device-id               [this spec]   7.6
1347    document-format-version                 [this spec]   7.6
1348    document-natural-language               [this spec]   7.6
1349
1350  job-cover-back-supported (1setOf type2 keyword) [this spec]   4.1.2.2
1351    <same as "cover-back-supported"         [pwg5100.3]   3.1.4
1352  job-cover-front-supported (1setOf type2 keyword) [this spec]  4.1.2.2
1353    <same as "cover-front-supported"        [pwg5100.3]   3.1.4
1354  job-mandatory-attributes (1setOf type2 keyword) [this spec]   3.1.2
1355    <any Job Template attribute keyword>
1356
1357  job-state-reasons (1setOf type2 keyword)  [rfc2911]     4.3.8
1358    digital-signature-did-not-verify        [this spec]   6.1
1359    digital-signature-type-not-supported    [this spec]   6.1
1360    errors-detected                         [this spec]   6.1
1361    job-digital-signature-wait              [this spec]   6.1
1362    warnings-detected                       [this spec]   6.1
1363
1364  media (type2 keyword | name(MAX))         [rfc2911]     4.2.11
1365    choice_iso_a4_210x297mm_na_letter_8.5x11in [this spec]  6.2
1366  print-content-optimize (type2 keyword)    [this spec]   4.2.2
1367    photo                                   [this spec]   4.2.2
1368    graphic                                 [this spec]   4.2.2
1369    text                                    [this spec]   4.2.2
1370    text-and-graphic                        [this spec]   4.2.2
1371
```

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## 1372    12.3 Enum Attribute Values

1373 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
1374 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.
1375

```
1376  job-finishings (1setOf type2 enum)          [this spec] 4.1.3.3
1377  job-finishings-default (1setOf type2 enum)  [this spec] 4.1.4.1
1378  job-finishings-ready (1setOf type2 enum)    [this spec] 4.1.4.2
1379  job-finishings-supported (1setOf type2 enum) [this spec] 4.1.4.3
1380    <enum values are the same as "finishings">
1381
1382  job-finishings-col-supported (1setOf type2 keyword)
1383                                              [this spec] 4.1.5.3
1384    <same as for "finishing-col-supported"    [pwg5100.3] 3.2.5
```

              

## 13 Internationalization Considerations

The internationalization considerations for the extensions defined in this specification are the same as for handling the Job object in [rfc2911].

## 14 Security Considerations

This specification adds no more security burden on Printer implementations than does [rfc2911].

## 15 Contributors

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## 16 Acknowledgments

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## 18 Annex A: Additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate Standard [pwg5101.1] to add the new 'choice_xxx'

This section also generalizes the choice mechanism for inclusion in a revision to the PWG IEEE/ISTO 5101.1 Candidate Standard [pwg5101.1].  This specification gives the *outline* of the proposed addition to [pwg5101.1] for information only, in order to agree to the one new value defined for use with IPPFAX, namely, **'choice_iso_a4_210x297mm_na_letter_8.5x11in'.**

The proposed extension to [pwg5101.1] will have the following requirements:

1422     1.  The ABNF will be extended to define the `'choice_'` prefix to introduce a list of choices of self describing
1423         names.

1424     2.  Following the `'choice_'` prefix will be two or more fully self describing names, including all three fields.

1425     3.  The order of the list of fully self describing names MUST be in alphabetic order, so that there is only one
1426         canonical order for each list of choices.

1427     4.  Printer MAY support dynamic combinations of supported values or MAY support the entire choice value as a
1428         conventional keyword which it simply matches for validation purposes.

1429     5.  Printer MUST map the choice value to a particular supported value when selecting the actual media for
1430         marking.

1431     6.  If the Printer supports a **'choice_xxx'** "media" attribute value and the "media-ready" Printer attribute, the
1432         Printer MUST include the **'choice_xxx'** value in its "media-ready" Printer attribute as well as the currently
1433         loaded value(s) when at least one of the members of a choice value is ready. For example, if
1434         **'iso_a4_210x297mm'** is loaded, then the "media-ready" Printer attribute MUST include the
1435         **'iso_a4_210x297mm'** and the **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** values.

## 19 Annex B: Change Log (informative - to be removed before publication)

1437 The following summaries of the changes in chronological order:

1438 Version 0.1, 18 May 2003:
1439     1. Split document out of Document Object specification.
1440     2. Moved "document-format-target" and "document-format-version-target" from the Job Template section to the
1441       Operation Attributes section so that it can be supplied with Document Creation operations and so that it
1442       MUST be honored, even if "job-attribute-fidelity" is 'false' or omitted.
1443     3. Removed all Document Description attributes and the concept of Job Level and Document Level. That
1444       terminology is introduced in the Document Object spec [ippdoc]. Now [ippdoc] is only an Informative
1445       Reference, not a Normative Reference.
1446
1447 Version 0.2, 19 May 2003:
1448     1. Did *not* include the document-format-target and document-format-version-target attributes. PSI has their own
1449       definitions and we can avoid the discussion as to whether they should be Document Template attributes or
1450       Operation attributes on Document Creation operations and whether there should be a "document-format-
1451       target-default" and a "document-format-version-target-default".
1452
1453 Version 0.3, 28 May 2003:
1454 Agreements reaches at the May 28, 2003 telecon:
1455     1. Moved the Close-Job operation to the futures specification.
1456     2. Added the "pages-per-subset" Job Template from [pwg5100.4]. See Appendix B section **Error! Reference
1457       source not found.** for the minor differences.
1458     3. Added the terms: "Best Effort, Finished Document, Page, Page Subset, and Sheet.
1459     4. Clarified the conformance relationships between "xxx" Operation attributes and their corresponding "xxx-
1460       default" and "xxx-supported" Printer attributes.
1461     5. Added rationale for each missing "xxx-default" and "xxx-supported" attribute.
1462     6. Added 'errors-detected' and 'warnings-detected' "job-state-reasons" values.
1463     7. Added the new **'choice_iso_a4_210x297mm_na_letter_8.5x11in'** "media" attribute value which is a choice
1464       of two approximately equal media.
1465     8. Added the requirements for choice media keyword values for inclusion in a revision of the PWG IEEE-ISTO
1466       5101.1.

1467    9. Changed the "document-format-implemented" member attribute from 1setOf mimeMediaType to
1468       mimeMediaType since it is the key attribute value.
1469    10. Added another "document-format-implemented" example.
1470    11. Updated the IANA section to agree with the additions.
1471
1472 Version 0.4, June 4, 2003:
1473    1. Moved "document-format-details-implemented" Printer Description attribute to Futures.
1474    2. Moved "pages-per-subset" (1setOf integer(1:MAX)) Job Template attribute to Futures.
1475    3. Removed all CONDITIONALLY REQUIRED and CMUST statements and made them OPTIONAL and MAY.
1476       Added a statement of the intent for these attributes, so avoid the conformance statement problems for this
1477       specification which is just a list of OPTIONAL attributes.
1478    4. Removed the new terms "Honor" and "Best Effort", since they are synonym for "Support" and the opposite.  It
1479       is confusing to have synonyms.
1480    5. Added all of the new Operation/Job Description attributes that describe Documents to be supplied in Job
1481       Creation operations and copied to the corresponding Job Description attributes as *default* values for the
1482       Document(s) of the Job.
1483    6. Added "output-device-default" and "output-device-supported" Printer attribute to provide the default for both
1484       the "output-device" Operation attribute and the "output-device-assigned" Job Description attribute.

1485    7. Added "document-message" and "document-name" as Operation/Job Description default Document
1486       attributes for the Job.
1487    8. Clarified that the 'none' value of the "document-digital-signature" must be implemented, but the administrator
1488       MAY remove the 'none' value in order to require signatures to be used.
1489    9. Sated that all supplied member attributes of the "document-format-details" Operation attribute MUST have a
1490       value, i.e., MUST NOT be empty.
1491    10. Normalized all of the Application Names and versions and Operating System Name values from the IANA
1492       Registry to lower case, as is done with most other IPP attributes, in order to facilitate matching.
1493 Moved the requirements for the new 'choice_xxx' values to be added to PWG 5101.1.
1494
1495 Version 0.6, July 26, 2003:
1496    1. Changed "output-device-requested" to "output-device"
1497    2. Made "output-device" a Job Template attribute, instead of an Operation attribute for the following two
1498       reasons: (1) so that it can be used at the Sheet level in "overrides" to print a Sheet containing color pages on
1499       a color printer while the other Sheets are printed on a black and white printer and (2) so that the "output-
1500       device-actual" can be used to indicate the actual device(s) used, since [rfc2911] "output-device-assigned" is
1501       only single valued.
1502    3. Updated introduction
1503    4. Added xxx-supplied to Job Description & updated table 5
1504    5. "output-device-default" explicitly prohibited & split out into its own section
1505    6. Added "output-device" multivalue issue/resolution.
1506    7. Added overrides summary and scoping of new attributes
1507    8. Added "-actual"s
1508    9. Added "output-device-ready" Job Template Printer attribute.
1509    10. Added Section 8 "Override Scope of Attributes"
1510    11. Added "print-content-optimized
1511

**NOTE: The following operational attribute has a corresponding Job Template attributes**

## output-device (name(127))

This OPTIONAL Operation attribute specifies the name of the target output device for a Printer that fans-out to multiple devices (see [rfc2911] section 2.1).  This allows the client to control which output device the Printer selects.  If this attribute is omitted, the Printer selects whichever output device seems best for the job in an implementation dependent manner.  The client can discover which output devices the Printer supports by querying the Printer's "output-device-supported" Printer attribute (see section 7.11).

If the Printer supports this Operation attribute, the Printer MUST support the "output-device-assigned" Job Description attribute with the same values (see [rfc2911] section 4.3.13).  See section 4.1.6 for additional information on "output-device" and related attributes.

ISSUE01: The Job Description attribute "output-device-assigned" is single-valued even though "output-device" can be supplied at the Job, Document and page Override (i.e. sheet) level.  Proposed resolution: Leave the Job Description attribute single-valued. This will prevent any interoperability problems with existing implementations.  It will also handle the majority of uses.  Add a single-valued Document Description attribute in [ippdoc] to handle document level.  Implementations that allow the routing of individual sheets should be capable of implementing "-actuals".  Even if they don't the "overrides" Template attribute will contain the requested output devices.

| **output-device-requested** | name(127) | client | MAY | §5.1.4 |

| **Job** | Job Template Attributes that operate on whole Jobs are not applicable as page overrides. |
| **Document** | Job Template Attributes that operate on whole Documents are not applicable as page overrides. (The Document Object [ippdoc] is used to apply overrides at this level.) |
| **Sheet** | Job Template Attributes that operate on whole Sheets, such as "media" and "finishings".  Attributes with this scope MAY be included in "overrides". |
| **Impression** | Job Template Attributes that operate on whole Impressions, such as "number-up" or "x-side1-image-shift". Attributes with this scope MAY be included in "overrides". |
| **Page** | Job Template Attributes that operate on whole Pages, such as "orientation-requested" or "print-quality".  Attributes with this scope MAY be included in "overrides". |

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Document

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document-charset

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document-charset-supplied

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document-digital-signature

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document-digital-signature-supplied

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document-format-details

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document-format-details-supplied

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document-format-supplied

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document-format-version

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document-format-version-supplied

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document-format-natural-language

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document-message

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document-message-supplied

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document-name

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document-name-supplied

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document-natural-language

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document-natural-language-supplied

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Document

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errors-count

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Job

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ipp-attribute-fidelity

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Job

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output-device-assigned

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Job

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warnings-count

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is only application when an Operation attribute is

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defined

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4.1.5.4