



The Printer Working Group

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Working Draft

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**IPP Job Extensions v1.1
(JOBEXT)**

Status: Initial

Abstract: [This specification defines an attribute for fine-grained fidelity, attributes and values to specify how Document data is processed, and status attributes and values to report issues encountered during processing.](#)

This is a PWG Working Draft. For a definition of a "PWG Working Draft", see:

<https://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf>

This specification is available electronically at:

<https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippjobext11-20180926.docx>

<https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippjobext11-20180926.pdf>

Deleted: This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model. 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 and 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.

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94 manufacturers, print server developers, operating system providers, network operating
95 system providers, network connectivity vendors, and print management application
96 developers. The PWG is chartered to make printers and the applications and operating
97 systems supporting them work together better. All references to the PWG in this document
98 implicitly mean “The Printer Working Group, a Program of the IEEE ISTO.”

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100 define print related protocols, interfaces, procedures, and conventions. A PWG standard is
101 a stable, well understood, and technically competent specification that is widely used with
102 multiple independent and interoperable implementations. Printer manufacturers and
103 vendors of printer related software benefit from the interoperability provided by voluntary
104 conformance to these standards.

105 For additional information regarding the Printer Working Group visit:

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201 1. Introduction

202 This specification defines an attribute for fine-grained fidelity, attributes and values to specify
 203 how Document data is processed, and status attributes and values to report issues
 204 encountered during processing.

205 1.1 Document Natural Language and Character Set

206 Certain Document formats are ambiguous about the natural language and character set
 207 used in a file. The Internet Printing Protocol/1.1 [STD92] defines the "document-natural-
 208 language" operation attribute to specify the natural language in Document Creation
 209 operations, but does not provide a way to specify the character set. In addition, there is no
 210 way for a Client to discover which languages and character sets are supported by a Printer
 211 for a given Document format. This specification defines attributes for specifying and
 212 discovering supported languages and character sets.

213 1.2 Attribute Fidelity

214 The Internet Printing Protocol/1.1 [STD92] defines the "ipp-attribute-fidelity" operation
 215 attribute to enforce the fidelity of all attributes in the Job Creation request. This specification
 216 defines an operation attribute to enforce the fidelity of a subset of attributes in the Job
 217 Creation request.

218 1.3 Rendering Optimizations

219 Most Printers are able to optimize output for different kinds of Document data, for example
 220 using a higher resolution for black text and lines, however the Internet Printing Protocol/1.1
 221 [STD92] only defines the "print-quality" and "printer-resolution" Job Template attributes that
 222 specify the overall quality and resolution of the output. This specification defines an attribute
 223 with corresponding values for specifying the type of optimizations to perform.

224 1.4 Printing on a Specific Output Device

225 The Internet Printing Protocol/1.1 [STD92] defines the "output-device-assigned" Job Status
 226 attribute but does not define corresponding Job Template or Printer Description attributes
 227 for specifying which Output Device to use for a Job.

228 1.5 Results of Job/Document Processing

229 The Internet Printing Protocol/1.1 [STD92] defines some Job Status attributes and values
 230 but none of them provide information about processing issues that do not prevent a Job or
 231 Document from being printed. This specification defines attributes and values for discovering
 232 those processing issues.

Deleted: IPP

Deleted: 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.¶

Deleted: 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].

270 [1.6 Obsolete Attributes and Values](#)

271 [The original Standard for the Internet Printing Protocol \(IPP\): Job Extensions \[PWG5100.7\]](#)
 272 [defines several attributes and values that have proven problematic from an interoperability](#)
 273 [and privacy standpoint. This specification obsoletes these attributes and values.](#)

277 **2. Terminology**

278 **2.1 Conformance Terminology**

279 Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD,
 280 SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as
 281 defined in Key words for use in RFCs to Indicate Requirement Levels [BCP14]. The term
 282 CONDITIONALLY REQUIRED is additionally defined for a conformance requirement that
 283 applies when a specified condition is true.

284 **2.2 Printing Terminology**

285 Normative definitions and semantics of printing terms are imported from the Internet Printing
 286 Protocol/1.1 [STD92].

287 *Document*: An object created and managed by a Printer that contains the description,
 288 processing, and status information. A Document object may have attached data and is
 289 bound to a single Job.

290 *Job*: An object created and managed by a Printer that contains description, processing, and
 291 status information. The Job also contains zero or more Document objects.

292 *Logical Device*: a print server, software service, or gateway that processes jobs and either
 293 forwards or stores the processed job or uses one or more Physical Devices to render output.

294 *Output Device*: a single Logical or Physical Device

295 *Physical Device*: a hardware implementation of an endpoint device, e.g., a marking engine, a
 296 fax modem, etc.

297 **2.3 Protocol Role Terminology**

298 This document also defines the following protocol roles to specify unambiguous
 299 conformance requirements:

300 *Client*: Initiator of outgoing connections and sender of outgoing operation requests
 301 (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] User Agent).

Deleted: <#>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 ... [1]

312 *Printer*: Listener for incoming connections and receiver of incoming operation requests
313 (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] Server) that represents one or more
314 Physical Devices or a Logical Device.

315 **2.4 Other Terminology**

316 *Document Creation Operation*: operations that accept Document Content. Specifically:
317 Print-Job, Print-URI, Send-Document and Send-URI. Note: Print-Job and Print-URI are
318 both Job Creation and Document Creation operations.

319 *Finished Document*: the result that the Printer produces on Sheets after the operations of
320 printing, folding, cutting, finishing, etc. are completed.

321 *Job Attribute*: an Operation attribute or a Job Template attribute that applies to the Job
322 (object) as a whole. For example, "job-name" is an Operation attribute and "job-priority" is
323 a Job Template attribute.

324 *Job Creation Operation*: operations that create Job objects, specifically: Print-Job, Print-URI,
325 and Create-Job as defined in [rfc2911].

326 *Operation Attribute*: an attribute supplied by a client in the Operation Attribute group of a
327 request in order to affect the behavior of the operation or an attribute returned by the Printer
328 in the Operation Attributes group in an operation response in order to report the results of
329 the operation. For some Operation attributes, the Printer copies the values supplied by the
330 client to corresponding Job Description attributes.

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

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

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

340 **2.5 Acronyms and Organizations**

341 *IANA*: Internet Assigned Numbers Authority, <http://www.iana.org/>

342 *IETF*: Internet Engineering Task Force, <http://www.ietf.org/>

343 *ISO*: International Organization for Standardization, <http://www.iso.org/>

344 *PWG*: Printer Working Group, <http://www.pwg.org/>

345 3. Requirements

346 3.1 Rationale

347 The Internet Printing Protocol/1.1 [STD92] defines many attributes and values for specifying
348 how Jobs and Documents are processed by a Printer. Given the need for specifying
349 Document processing options and retrieving processing status information, this specification
350 should:

- 351 1. Define attributes and values that specify the Document character set and
- 352 rendering optimizations;
- 353 2. Define an attribute for doing selective fidelity enforcement;
- 354 3. Define a media size for automatically printing Documents on the correct size;
- 355 and
- 356 4. Define attributes and values that allow a Client to discover the results of
- 357 Document processing.

358 3.2 Use Cases

359 3.2.1 Print a Plain Text File

360 Jane has a plain text file report using a character set other than UTF-8 that she would like
361 to print. She submits the file for printing using her Client software, which allows her to specify
362 the exact character set used for the report.

363 3.2.2 Print a Document Using a Matching Size

364 John is viewing a document in a web browser and decides to print it. He submits the file for
365 printing from the browser which specifies the output should be formatted for US Letter or
366 ISO A4 media, as available on the printer.

367 3.2.3 Force a Document to Print on a Specific Media Size

368 Elizabeth has a contract that must be printed on US Legal media. She uses her Client
369 software to submit the print job, specifying that US Legal size must be used with no
370 substitutions.

371 3.2.4 Print a Presentation with Best Quality.

372 Bob wants to print a presentation. He submits the presentation for printing using his Client
373 software, specifying that the output should be optimized for text and graphics.

Deleted: Given the following existing specifications

Deleted: ¶
Title of First Specification [REFERENCE1]¶
Title of Second Specification [REFERENCE2]¶
...¶
Title of Nth Specification [REFERENCEN]¶
And g

Deleted: WHAT YOU NEED, the TITLE OF DOCUMENT

Deleted: <#>Provide foo, ¶
<#>Define bar, and ¶
<#>Define bla

Moved (insertion) [7]

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

390 **3.2.5 Print Using a Specific Output Device**

391 [Sally needs to print a poster on a specific output device. She uses her Client software to](#)
392 [select the large format printer associated with the local print service and submit the poster](#)
393 [for printing.](#)

394 **3.2.6 Monitor Whether Jobs are Printed Correctly**

395 [Mary is the administrator for the office printers and wants to know whether users are having](#)
396 [difficulty printing their documents. She uses Client software to query the history of jobs on](#)
397 [each printer, including any errors or warnings that were encountered during processing.](#)

398 **3.3 Exceptions**

399 **3.3.1 Too Many Jobs on a Printer**

400 [Jane has several documents to print for a meeting. While submitting the documents for](#)
401 [printing from her Client software, the printer responds that there are too many queued jobs.](#)

402 **3.3.2 Too Many Documents in a Job**

403 [Bob is submitting multiple documents in a single job. While submitting the documents from](#)
404 [his Client software, the printer responds that there are too many documents in the job.](#)

405 **3.4 Out of Scope**

406 The following are considered out of scope for this specification:

- 407 1. Definition of new file formats; and
- 408 2. Definition of new protocol bindings.

409 **3.5 Design Requirements**

410 The design requirements for this specification are:

- 411 1. [Define attributes for supported languages and character sets in Document data;](#)
- 412 2. [Define attributes and values to describe the kind of processing optimizations that](#)
- 413 [should be performed on Document data;](#)
- 414 3. [Define an attribute to specify fidelity requirements;](#)
- 415 4. [Define attributes to select an Output Device for printing;](#)
- 416 5. [Define attributes and values to report processing errors and warnings;](#) and
- 417 6. [Define sections to register all attributes, values, and operations with IANA.](#)

421

Deleted: Provide exceptions for the use cases using the casual use case format.

Deleted: ...;

Deleted: operations for ...

Deleted: ¶ Define security requirements necessary to support ...;

Deleted: The design recommendations for this specification are:¶ Support additional "nice to have" use cases¶

Model¶ Provide detailed data model and semantic information starting in section 4. Definition of data elements/attributes and operations happen in later sections.¶

This section defines Operation attributes for use in Job Creation operations and/or Document Creation operations and as such describe characteristics of the Job and Document, rather than instructions to the Printer. For some of these Operation attributes there are corresponding "xxx-default" and "xxx-supported" Printer Description attributes (see section 7).¶ Table 4 lists the Operation attributes and their attribute syntaxes supplied in Job Creation and Document Creation operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer Description attributes, if any. A "-" indicates that there isn't an "xxx-default" or "xxx-supported" Printer Description attribute.¶

Table 4 - Operation, Default, and Supported Attributes¶

Operation attribute: ¶ attribute name "xxx" ... [2]

457 **4. New Attributes**

458 **4.1 Operation Attributes**

459 **4.1.1 job-mandatory-attributes (1setOf keyword)**

460 This attribute identifies which Job Template attributes the Printer MUST support in the Job
461 Creation request in order to accept the Job. The values are the names of Job Template
462 attributes, for example, 'job-hold-until', 'copies', and 'media'. In order to identify a member
463 attribute of a collection attribute, the keyword names of both the collection attribute and the
464 member attribute are given separated by a period (.) character. For example, to make the
465 "media" attribute of the "cover-front" collection attribute mandatory, supply the keyword value
466 'cover-front.media'.

467 Note: As with "ipp-attribute-fidelity", the "job-mandatory-attributes" attribute does not
468 determine whether the Printer overrides the PDL with the identified Job Template attributes,
469 as that functionality is defined by the "pdl-override-supported" Printer Description attribute
470 JSTD921.

474 **4.2 Document and Job Status Attributes**

475 **4.2.1 errors-count (integer(0:MAX))**

476 This attribute reports the number of errors encountered processing the Job as a whole. An
477 error where some portion of the printed output is not present, such as a glyph encountered
478 which isn't in a Printer's font or an image in a page was in a format that the Printer didn't
479 support, though the Printer did support the overall Document format.

480 **4.2.2 print-content-optimize-actual (1setOf type2 keyword)**

481 This attribute reports the "print-content-optimize" value(s) that the Printer actually used to
482 produce the Job.

483 **4.2.3 warnings-count (integer(0:MAX))**

484 This attribute reports the number of warnings encountered processing the Job as a whole.
485 A warning is where no information is lost but the appearance of the printed output MAY not
486 be as expected.

- Deleted: OPTIONAL Operation
- Deleted: permits the client to
- Deleted: y
- Deleted: this
- Moved down [8]: The Printer MUST reject this Job Creation operation if the client supplies an unsupported Job Template attribute or value in the request that is also identified in this list. The client MAY supply the "job-mandatory-attributes" Operation attribute in a Job Creation operation or Validate-Job operation and MUST NOT supply this attribute in any other operation. If the Printer supports the "job-mandatory-attributes" Operation attribute, the Printer MUST support this attribute in all Job Creation operations that it supports and in the Validate-Job operation. ¶ If the client supplies the "job-mandatory-attributes" Operation attribute and the 'ipp-attribute-fidelity' Operation attribute with the 'true' value, the Printer MUST ignore the "job-mandatory-attributes", since the client is
- Deleted: doesn't support, the Printer MUST. [3]
- Deleted: The
- Deleted: has nothing to do with
- Deleted: (see [rfc2911] sections 4.4.28 and 15)
- Deleted: <#>Operation Attributes ¶ ... [4]
- Moved down [1]: <#>If a client supplies the
- Deleted: <#>document-digital-signature... [5]
- Deleted: Most of the existing "job-state" and [6]
- Moved down [2]: errors-count
- Moved down [3]: warnings-count
- Moved (insertion) [2]
- Deleted: OPTIONAL Job Description
- Deleted: counts
- Deleted: j
- Deleted:
- Deleted: the
- Deleted: d
- Deleted: OPTIONAL Job Description
- Deleted: specifies
- Deleted:
- Deleted: j
- Deleted: [ippact]
- Deleted: The Printer MAY support this Job [7]
- Moved (insertion) [3]
- Deleted: OPTIONAL Job Description
- Deleted: counts
- Deleted: j
- Deleted: ,

897 **4.3 Document and Job Template Attributes**

899 **4.3.1 output-device (name(127))**

900 This attribute requests a named Output Device for a Printer that fans-out to multiple devices.
901 If omitted, the Printer selects the best Output Device for the Job in an implementation
902 dependent manner.

903 **4.3.2 print-content-optimize (type2 keyword)**

904 This attribute specifies the type of optimization and/or processing to perform on the
905 Document data and refines the value specified by the "print-quality" attribute [ST92].
906 Keyword values include:

907 'graphics': Optimize for graphic clarity of graphs and line drawings.

908 'photo': Optimize for photographic clarity.

909 'text': Optimize for text clarity.

910 'text-and-graphics': Optimize for both text and graphic clarity.

911 **4.4 Printer Description Attributes**

914 **4.4.1 document-charset-default (charset)**

915 This attribute specifies the default charset that the Printer will assume for charset-ambiguous
916 Document formats when the Client omits the "document-charset" operation attribute
917 [PWG5100.5]. Printers that support the "document-charset" operation attribute MUST
918 support this attribute.

919 **4.4.2 document-charset-supported (1setOf charset)**

920 This attribute lists the charsets that the Printer supports for charset-ambiguous Document
921 formats. Printers that support the "document-charset" operation attribute [PWG5100.5]
922 MUST support this attribute.

924 **4.4.3 document-natural-language-default (naturalLanguage)**

925 This attribute specifies the default natural language that the Printer will assume for
926 Document data when the Client omits the "document-natural-language" operation attribute
927 [STD92]. Printers that support the "document-natural-language" attribute MUST support
928 this.

Deleted: Table 7 lists the new Job Template attributes defined in this specification. These Job Template attributes can be supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations and the Validate-Job operation. ¶
Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request. If a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section 4.2). In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined. ¶
Table 7 - Job Template attributes ¶
Job Template attribute name "xxx" ... [8]

Deleted: OPTIONAL Job Template ... attribute specifies the ...equests a named of the target output ...utput device ...evice 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 ...mitted, the Printerrg ¶

Moved down [4]: <#>output-device-supported (1setOf name(127)) ¶

Deleted: <#>Why there is no output-device-default ¶ ... [10]

Deleted: <#>output-device-actual (1setOf name(127)) ¶ ... [11]

Deleted: OPTIONAL Job Template ... attribute specifies the type of optimization and/or processing to perform on the Document data ¶ [12]

Deleted: optimize ...ptimize for graphic clarity such as ... [13]

Deleted: optimize

Deleted: optimize

Deleted: optimize

Moved down [5]: <#>print-content-optimize-default (type2 keyword) ¶

Deleted: <#>print-content-optimize-actual (1setOf type2 keyword) ¶ ... [14]

Deleted: This section lists the new Printer Description attributes defined in this document. These Printer attributes are "xxx-supported" ¶ [15]

Deleted: OPTIONAL Printer Description attribute indicates ...pecifies the default charset that the Printer will assume for charset- ... [16]

Deleted: OPTIONAL Printer Description attribute indicates ...ists the charsets that the Printer supports for charset-ambiguous in... [17]

Deleted: <#>document-digital-signature-default (type2 keyword) ¶ ... [18]

Deleted: OPTIONAL Printer Description attribute indicates ...pecifies the default document ...atural language that the Printer ¶ [19]

1391 **4.4.4 document-natural-language-supported (1setOf naturalLanguage)**

1392 This attribute lists the natural languages supported for Printer-supported Document formats.
1393 Printers that support the "document-natural-language" attribute MUST support this attribute.

1394 **4.4.5 output-device-supported (1setOf name(127))**

1395 This attribute lists the supported "output-device" values. Printers MUST support this attribute
1396 if the "output-device" Job Template attribute (section 4.3.1) is supported.

1397 **4.4.6 print-content-optimize-default (type2 keyword)**

1398 This attribute specifies the default "print-content-optimize" (section 4.3.2) value. Printers that
1399 support the "print-content-optimize" attribute MUST support this attribute.

1400 **4.4.7 print-content-optimize-supported(1setOf type2 keyword)**

1401 This attribute lists the supported "print-content-optimize" (section 4.3.2) values. Printers that
1402 support the "print-content-optimize" attribute MUST support this attribute.

1403 **5. New Values for Existing Attributes**

1404 **5.1 job-state-reasons (1setOf type2 keyword)**

1406 This specification adds the following new keyword values for the "job-state-reasons" Job
1407 Status attribute [STD92]:

1408 'digital-signature-did-not-verify': One or more documents in the Job contains a
1409 digital signature type that is supported (see section 1.1), but the signature did not
1410 verify when the Printer attempted to verify the signature.

1411 'errors-detected' : If the Printer supports this value, the Printer MUST add this value
1412 to "job-state-reasons" when the Printer generates the first error message. That is, a
1413 single occurrence of this value is present in the "job-state-reasons" Job Description
1414 attribute if the Printer has generated one or more errors. An error indicates loss of
1415 information, such as a page not imaged. See also the 'warnings-detected' value.

1416 'warnings-detected' : If the Printer supports this value, the Printer MUST add this
1417 value to "job-state-reasons" when the Printer generates the first warning message.
1418 That is, a single occurrence of this value is present in the "job-state-reasons" Job
1419 Description attribute if the Printer has generated one or more warnings. A warning
1420 indicates something did not go as expected, but there was no loss of information.
1421 For example, a font substitution. See also the 'errors-detected' value.

Deleted: OPTIONAL Printer Description

Deleted: in any of the supported

Deleted: document

Deleted: , that is, it is the union of the natural languages

Deleted: The

Deleted: if it supports the "document-natural-language" Operation attribute ([rfc2911] section 3.2.1.1)

Moved (insertion) [4]

Deleted: OPTIONAL Job Template Printer

Deleted: specifies

Deleted: The

Deleted: it supports

Deleted:

Moved (insertion) [5]

Deleted: OPTIONAL Job Template Printer

Deleted: The

Deleted: if it supports the "output-device" Job Template attribute

Deleted: OPTIONAL Job Template Printer

Deleted: specifies

Deleted: The

Deleted: if it supports the "output-device" Job Template attribute

Deleted: New

Deleted: Values

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

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

Note: While values cannot be added to the "job-state" attributes without impacting deployed clients that take actions upon receiving "job-state" values, it is the intent that additional "job-state-reasons" values can be defined and registered without impacting such deployed clients. In other words, the "job-state-reasons" attribute are intended to be extensible. ¶ ... [20]

Deleted: For ease of understanding, the following value descriptions are presented in the

Moved down [6]: 'digital-signature-type-not-supported': One or more documents in

1523 **5.2 media (type2 keyword | name(MAX))**

1524 This [specification adds the following](#) new [keyword](#) value for the "media" Job Template
1525 attribute [\[STD92\]](#):

1526 'choice_iso_a4_210x297mm_na_letter_8.5x11in': The [Client](#) has explicitly allowed
1527 a choice of media for the Job. The Printer MUST choose physical media of size
1528 na_letter_8.5x11in (215.9 x 279.4 mm) or iso_a4_210x297mm [and MUST NOT](#)
1529 choose physical media of any other size. The Printer MAY scale the [Document data](#)
1530 to fit, but any scaling MUST be isomorphic scaling and without image content loss.

1531 **6. New Status Codes**

1532 This section defines additional [status code](#) values.

1533 **6.1 server-error-too-many-jobs (0x050B)**

1534 The [Client](#) has attempted to create a Job using any of the Job Creation operations which
1535 would exceed the capacity of the Printer. The [Client](#) MAY try the unmodified request again
1536 at some later point in time with an expectation that the capacity condition may have changed.

1537 **6.2 server-error-too-many-documents (0x050C)**

1538 The [Client](#) has attempted to create a Document using any of the Document Creation
1539 operations which would exceed the capacity of the Printer for this Job. The [Client](#) MAY try
1540 the unmodified request again at some later point in time with an expectation that the capacity
1541 condition may have changed.

1544 **7. Obsolete Attributes**

1545 **7.1 Obsolete Operation Attributes**

1546 [The following operation attributes from Standard for the Internet Printing Protocol \(IPP\): Job](#)
1547 [Extensions \[PWG5100.7\] are now obsolete:](#)

1548 "[document-digital-signature](#)" (type2 keyword): [This attribute only identifies the type](#)
1549 [of signature that is present in the Document data, but that information can be](#)
1550 [determined by examining the Document data.](#)

1551 "[document-format-details](#)" (1setOf collection): [The member attributes and values](#)
1552 [cause serious interoperability and privacy issues.](#)

1553 "[document-format-version](#)" (text(127)): [Free form text values cause serious](#)
1554 [interoperability issues when used as identifiers for processing data.](#)

Deleted: New

Deleted: 3

Deleted: Values

Deleted: section

Deleted: specifies one

Deleted: client

Deleted:

Deleted: . The Printer

Deleted:

Deleted: image

Deleted: , or overflow to additional sheets (so-called tiling), or truncate (and MUST notify the sending user and receiving user by implementation means if truncation is performed, since that is loss of information)

Moved up [7]: Rationale: If printing by reference, the size of the document isn't known by the submitter.¶

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

Deleted: for the IPP/1/1 operational attribute "status-code".. The "status-code" attribute provides information on the processing of an operation. (See [rfc2911] sections 3.1.6.1 and 13)

Deleted: client

Deleted: client

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Moved (insertion) [1]

Deleted: If a client supplies the "document-charset" Operation attribute in a Document Creation operation with a value that the Printer doesn't support, the Printer MUST reject the job and return the status code 'client-error-charset-not-supported' (see [rfc2911] section 3.1.4.14), since the interpretation of the content will be mis-understood by the Printer.¶
The standard values for these attributes are Internet Media types (sometimes called MIME types). For further details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9. ¶
The Printer MUST support this attribute if it supports a document format for which the Document Content can be ambiguous with respect to the charset being used to encode the data. For example, the 'application/vnd.hp-PCL' MAY omit the charset escape sequence. Although [rfc2854] strongly RECOMMENDS that 'text/html', include a "; charset=charset" parameter in the MIME type itself (that is, explicitly in the value of the "document-format" attribute), often the charset= parameter is not [2]

1696 **7.2 Obsolete Job Status Attributes**

1697 The following Job Status attributes from Standard for the Internet Printing Protocol (IPP):
1698 Job Extensions [PWG5100.7] are now obsolete:

1699 "compression-supplied" (type2 keyword): Data compression is used over the HTTP
1700 transport during the submission of Document data and auditing of Printer bandwidth
1701 usage requires additional information such as the size of the IPP request and
1702 attached compressed document data.

1703 "document-charset-supplied" (charset): The "document-charset" attribute is only
1704 used for the internal processing of the Document data.

1705 "document-digital-signature-supplied" (type2 keyword): The corresponding Job
1706 Template attribute is obsolete.

1707 "document-format-details-supplied" (1setOf collection): The corresponding Job
1708 Template attribute is obsolete.

1709 "document-format-supplied" (mimeMediaType): This attribute has been superseded
1710 by the "document-format" Document Status attribute [PWG5100.5].

1711 "document-format-version-supplied" (text(127)): The corresponding Job Template
1712 attribute is obsolete.

1713 "document-message-supplied" (text(MAX)): This attribute has been superseded by
1714 the "document-message" Document Status attribute [PWG5100.5].

1715 "document-name-supplied" (name(MAX)) : This attribute has been superseded by
1716 the "document-name" Document Status attribute [PWG5100.5].

1717 "document-natural-language-supplied" (naturalLanguage): This attribute has been
1718 superseded by the "document-natural-language" Document Status attribute
1719 [PWG5100.5].

1720 "ipp-attribute-fidelity" (boolean): This attribute is only used at time of Job creation.
1721 The "xxx-actual" Job Status attributes provide a receipt of attributes and values that
1722 were used when processing a Job and thus provide the necessary auditing
1723 information.

1724 "job-copies-actual" (integer(1:MAX)): This attribute has poor interoperability with the
1725 "copies" Job Template attribute [STD92].

1726 "job-cover-back-actual" (collection): This attribute has poor interoperability with the
1727 "cover-back" Job Template attribute [PWG5100.3].

1728 "job-cover-front-actual" (collection): This attribute has poor interoperability with the
1729 "cover-front" Job Template attribute [PWG5100.3].

- 1730 ["job-finishings-actual" \(1setOf type2 enum\): This attribute has poor interoperability](#)
1731 [with the "finishings" Job Template attribute \[STD92\].](#)
- 1732 ["job-finishings-col-actual" \(1setOf collection\): This attribute has poor interoperability](#)
1733 [with the "finishings-col" Job Template attribute \[PWG5100.3\].](#)
- 1734 ["job-mandatory-attributes" \(1setOf keyword\): This attribute is only used at time of](#)
1735 [Job creation. The "xxx-actual" Job Status attributes provide a receipt of attributes](#)
1736 [and values that were used when processing a Job and thus provide the necessary](#)
1737 [auditing information.](#)
- 1738 ["output-device-actual" \(1setOf name\(127\)\): This attribute provides the same](#)
1739 [functionality as the "output-device-assigned" attribute \[STD92\].](#)

1740 **7.3 Obsolete Job Template Attributes**

1741 [The following Job Templates attributes from Standard for the Internet Printing Protocol \(IPP\):](#)
1742 [Job Extensions \[PWG5100.7\] are now obsolete:](#)

- 1743 ["job-copies" \(integer\(1:MAX\)\): This attribute has poor interoperability with the](#)
1744 ["copies" Job Template attribute \[STD92\].](#)
- 1745 ["job-cover-back" \(collection\): This attribute has poor interoperability with the "cover-](#)
1746 [back" Job Template attribute \[PWG5100.3\].](#)
- 1747 ["job-cover-front" \(collection\): This attribute has poor interoperability with the "cover-](#)
1748 [front" Job Template attribute \[PWG5100.3\].](#)
- 1749 ["job-finishings" \(1setOf type2 enum\): This attribute has poor interoperability with the](#)
1750 ["finishings" Job Template attribute \[STD92\].](#)
- 1751 ["job-finishings-col" \(1setOf collection\): This attribute has poor interoperability with](#)
1752 [the "finishings-col" Job Template attribute \[PWG5100.3\].](#)

1753 **7.4 Obsolete Printer Description Attributes**

1754 [The following Printer Description attributes from Standard for the Internet Printing Protocol](#)
1755 [\(IPP\): Job Extensions \[PWG5100.7\] are now obsolete:](#)

- 1756 ["document-digital-signature-default" \(type2 keyword\):](#)
- 1757 ["document-digital-signature-supported" \(1setOf type2 keyword\):](#)
- 1758 ["document-format-details-default" \(collection\):](#)
- 1759 ["document-format-details-supported" \(1setOf keyword\):](#)

- 1760 ["document-format-version-default" \(text\(127\)\)](#);
- 1761 ["document-format-version-supported" \(1setOf text\(127\)\)](#);
- 1762 ["job-copies-default" \(integer\(1:MAX\)\)](#): This attribute has poor interoperability with
1763 [the "copies" Job Template attribute \[STD92\]](#).
- 1764 ["job-copies-supported" \(rangeOfInteger\(1:MAX\)\)](#): This attribute has poor
1765 [interoperability with the "copies" Job Template attribute \[STD92\]](#).
- 1766 ["job-cover-back-default" \(collection\)](#): This attribute has poor interoperability with the
1767 ["cover-back" Job Template attribute \[PWG5100.3\]](#).
- 1768 ["job-cover-back-supported" \(1setOf keyword\)](#): This attribute has poor
1769 [interoperability with the "cover-back" Job Template attribute \[PWG5100.3\]](#).
- 1770 ["job-cover-front-default" \(collection\)](#): This attribute has poor interoperability with the
1771 ["cover-front" Job Template attribute \[PWG5100.3\]](#).
- 1772 ["job-cover-front-supported" \(1setOf keyword\)](#): This attribute has poor interoperability
1773 [with the "cover-front" Job Template attribute \[PWG5100.3\]](#).
- 1774 ["job-finishings-default" \(1setOf type2 enum\)](#): This attribute has poor interoperability
1775 [with the "finishings" Job Template attribute \[STD92\]](#).
- 1776 ["job-finishings-ready" \(1setOf type2 enum\)](#): This attribute has poor interoperability
1777 [with the "finishings" Job Template attribute \[STD92\]](#).
- 1778 ["job-finishings-supported" \(1setOf type2 enum\)](#): This attribute has poor
1779 [interoperability with the "finishings" Job Template attribute \[STD92\]](#).
- 1780 ["job-finishings-col-default" \(1setOf collection\)](#): This attribute has poor interoperability
1781 [with the "finishings-col" Job Template attribute \[PWG5100.3\]](#).
- 1782 ["job-finishings-col-ready" \(1setOf collection\)](#): This attribute has poor interoperability
1783 [with the "finishings-col" Job Template attribute \[PWG5100.3\]](#).
- 1784 ["job-finishings-col-supported" \(1setOf keyword\)](#): This attribute has poor
1785 [interoperability with the "finishings-col" Job Template attribute \[PWG5100.3\]](#).

1786 [8. Obsolete Values](#)

1787 [8.1 Obsolete "job-state-reasons" Values](#)

- 1788 [The following keyword values from Standard for the Internet Printing Protocol \(IPP\): Job](#)
1789 [Extensions \[PWG5100.7\] are now obsolete:](#)

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1790 ~~'digital-signature-type-not-supported'~~: This value is obsolete because the
1791 corresponding "document-digital-signature" Job Template attribute is obsolete.

1792 ~~'job-digital-signature-wait'~~: This value is obsolete because the corresponding
1793 "document-digital-signature" Job Template attribute is obsolete.

1794 9. Additional Semantics for Existing Operations

1795 9.1 Create-Job, Print-Job, Print-URI, Validate-Job: job-mandatory- 1796 attributes

1797 This specification extends the Create-Job, Print-Job, Print-URI, and Validate-Job operations
1798 to support the "job-mandatory-attributes" operation attribute (section 4.1.1) in the request
1799 sent by the Client, which specifies a list of Job Template attributes that MUST be supported
1800 by the Printer for the request to be accepted.

1801 If the "job-mandatory-attributes" operation attribute is supported, the Client MAY supply and
1802 the Printer MUST accept the "job-mandatory-attributes" operation attribute in any Job
1803 Creation or Validate-Job request.

1804 The Printer MUST reject the Job Creation request if the Client supplies an unsupported Job
1805 Template attribute or value in the request that is included in this list of "job-mandatory-
1806 attributes" values.

1807 If the Client supplies both the "job-mandatory-attributes" and "ipp-attribute-fidelity" operation
1808 attributes, the Printer MUST ignore the "job-mandatory-attributes" attribute.

1809 9.2 Create-Job, Print-Job, Print-URI: server-error-too-many-jobs Status 1810 Code

1811 This specification extends the Job Creation operations to return the 'server-error-too-many-
1812 jobs' status code value when the Printer is currently unable to create a new Job object.

1813 9.3 Print-Job, Print-URI, Send-Document, Send-URI: server-error-too- 1814 many-documents Status Code

1815 This specification extends the Document Creation operations to return the 'server-error-too-
1816 many-documents' status code value when the Printer is currently unable to create a new
1817 Document object.

Moved (insertion) [6]

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

Deleted: The Job is currently being held because the Job was submitted with a "document-digital-signature" attribute value that is not supported. ¶

Moved (insertion) [8]

Deleted: this

Deleted: operation

Deleted: c

Deleted: also identified

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

Deleted: c

Deleted: Operation attribute

Deleted: the '

Deleted: O

Deleted: with the 'true' value

Deleted: , since the client is requesting that all of the supplied Job Template attributes in the Job Creation request MUST be supported in order for the Printer to accept the Job

Deleted:

1850 **10. Conformance Requirements**

1851 **10.1 Printer Conformance Requirements**

1852 In order for a Printer to claim conformance to this specification, a Printer MUST support:

- 1853 1. [The Job Status attributes defined in section 4.2 that correspond to any](#)
- 1854 [supported Job Template attributes defined in section 4.3;](#)
- 1855 2. [The Document Status attributes defined in section 4.2 that correspond to any](#)
- 1856 [supported Document Template attributes defined in section 4.3;](#)
- 1857 3. [The Printer Description attributes defined in section 4.4 that correspond to any](#)
- 1858 [supported Document/Job Template attributes defined in section 4.3;](#)
- 1859 4. [The additional values defined in section 5;](#)
- 1860 5. [The internationalization considerations defined in section 11; and](#)
- 1861 6. [The security considerations defined in section 12.](#)

1862 [Printers that support the "job-mandatory-attributes" operation attribute \(section 4.1.1\) MUST](#)

1863 [also support the additional semantics defined in section 9.1.](#)

1864 **10.2 Client Conformance Requirements**

1865 In order for a Client to claim conformance to this specification, a Client MUST support:

- 1866 1. The internationalization considerations defined in section 11; and
- 1867 2. The security considerations defined in section 12.

1868 **11. Internationalization Considerations**

1869 For interoperability and basic support for multiple languages, conforming implementations

1870 MUST support:

- 1871 1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)
- 1872 [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
- 1873 2. The Unicode Format for Network Interchange [RFC5198] which requires
- 1874 transmission of well-formed UTF-8 strings and recommends transmission of
- 1875 normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

1876 Unicode NFC is defined as the result of performing Canonical Decomposition (into base

1877 characters and combining marks) followed by Canonical Composition (into canonical

1878 composed characters wherever Unicode has assigned them).

1879 WARNING – Performing normalization on UTF-8 strings received from Clients and

1880 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client

1881 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now

1882 'hidden').

Deleted: The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see section 5.1.3) for auditing and trouble-shooting purposes.¶

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

The Printer MUST accept any keyword values for the "job-mandatory-attributes" attribute itself whether or not the corresponding Job Template attributes are supported by the Printer and MUST NOT return any unsupported keywords in the Unsupported Attributes Group in the response. If the client supplies this "job-mandatory-attributes" Operation attribute in a Job Creation operation with values that represent Job Template attributes that the Printer

¶ doesn't support, the Printer MUST otherwise accept the attribute anyway. The Printer MUST reject this Job Creation only if the client *actually supplies* any of the identified Job Template attributes that the Printer doesn't support. Because the Printer doesn't reject when the "job-mandatory-attributes" Operation attribute has unsupported attribute keyword names, the client MAY supply all of the attribute keyword names that the client supports without having to tailor the list to the particular Printer to which the client is submitting the Job Creation operation, thereby simplifying client use of this attribute.

- Deleted:** required
- Deleted:** and values
- Deleted:** ??
- Deleted:** <#> The required operations defined in section ??,¶
- Deleted:** <#> ??
- Deleted:** <#> ¶

1932 Implementations of this specification SHOULD conform to the following standards on
1933 processing of human-readable Unicode text strings, see:

1934 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical

1935 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping

1936 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]

1937 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

1938 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization

1939 Unicode Collation Algorithm [UTS10] – sorting

1940 Unicode Locale Data Markup Language [UTS35] – locale databases

1941 Implementations of this specification are advised to also review the following informational
1942 documents on processing of human-readable Unicode text strings:

1943 Unicode Character Encoding Model [UTR17] – multi-layer character model

1944 Unicode Character Property Model [UTR23] – character properties

1945 Unicode Conformance Model [UTR33] – Unicode conformance basis

1946 **12. Security Considerations**

1947 The IPP extensions defined in this document require the same security considerations as
1948 defined in the Internet Printing Protocol/1.1 [STD92].

1949 Implementations of this specification SHOULD conform to the following standard on
1950 processing of human-readable Unicode text strings, see:

1951 Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

1952 Implementations of this specification are advised to also review the following informational
1953 document on processing of human-readable Unicode text strings:

1954 Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

1955 **13. IANA Considerations**1956 **13.1 Attribute Registrations**

1957 The attributes defined in this specification will be published by IANA according to the
 1958 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1959 <http://www.iana.org/assignments/ipp-registrations>

1960 The registry entries will contain the following information:

1961	Document Status attributes:	Reference
1962	-----	-----
1963	compression-supplied(obsolete) (type2 keyword)	[PWG5100.7]
1964	document-charset-supplied(obsolete) (charset)	[PWG5100.7]
1965	document-digital-signature-supplied(obsolete) (type2 keyword)	
1966		[PWG5100.7]
1967	document-format-details-supplied(obsolete) (1setOf collection)	
1968		[PWG5100.7]
1969	document-format-supplied(obsolete) (mimeMediaType)	[PWG5100.7]
1970	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1971	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1972	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1973	document-natural-language-supplied(obsolete) (naturalLanguage)	
1974		[PWG5100.7]
1975	errors-count (integer(0:MAX))	[PWG5100.7]
1976	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
1977	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
1978	warnings-count (integer(0:MAX))	[PWG5100.7]
1979		
1980	Document Template attributes:	Reference
1981	-----	-----
1982	output-device (name(127))	[PWG5100.7]
1983	print-content-optimize (type2 keyword)	[PWG5100.7]
1984		
1985	Job Status attributes:	Reference
1986	-----	-----
1987	compression-supplied(obsolete) (type2 keyword)	[PWG5100.7]
1988	document-charset-supplied(obsolete) (charset)	[PWG5100.7]
1989	document-digital-signature-supplied(obsolete) (type2 keyword)	
1990		[PWG5100.7]
1991	document-format-details-supplied(obsolete) (1setOf collection)	
1992		[PWG5100.7]
1993	document-format-supplied(obsolete) (mimeMediaType)	[PWG5100.7]
1994	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1995	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1996	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1997	document-natural-language-supplied(obsolete) (naturalLanguage)	
1998		[PWG5100.7]
1999	errors-count (integer(0:MAX))	[PWG5100.7]
2000	ipp-attribute-fidelity(obsolete) (boolean)	[PWG5100.7]
2001	job-copies-actual(obsolete) (integer(1:MAX))	[PWG5100.7]
2002	job-cover-back-actual(obsolete) (collection)	[PWG5100.7]

2003	job-cover-front-actual(obsolete) (collection)	[PWG5100.7]
2004	job-finishings-actual(obsolete) (1setOf type2 enum)	[PWG5100.7]
2005	job-finishings-col-actual(obsolete) (1setOf collection)	[PWG5100.7]
2006	job-mandatory-attributes(obsolete) (1setOf keyword)	[PWG5100.7]
2007	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
2008	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
2009	warnings-count (integer(0:MAX))	[PWG5100.7]
2010		
2011	Job Template attributes:	Reference
2012	-----	-----
2013	job-copies(obsolete) (integer(1:MAX))	[PWG5100.7]
2014	job-cover-back(obsolete) (collection)	[PWG5100.7]
2015	job-cover-front(obsolete) (collection)	[PWG5100.7]
2016	job-finishings(obsolete) (1setOf type2 enum)	[PWG5100.7]
2017	job-finishings-col(obsolete) (1setOf collection)	[PWG5100.7]
2018	output-device (name(127))	[PWG5100.7]
2019	print-content-optimize (type2 keyword)	[PWG5100.7]
2020		
2021	Operation attributes:	Reference
2022	-----	-----
2023	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.7]
2024	document-format-details(obsolete) (1setOf collection)	[PWG5100.7]
2025	document-format-version(obsolete) (text(127))	[PWG5100.7]
2026	job-mandatory-attributes (1setOf keyword)	[PWG5100.7]
2027		
2028	Printer Description attributes:	Reference
2029	-----	-----
2030	document-charset-default (charset)	[PWG5100.7]
2031	document-charset-supported (1setOf charset)	[PWG5100.7]
2032	document-digital-signature-default(obsolete) (type2 keyword)	[PWG5100.7]
2033	document-digital-signature-supported(obsolete) (1setOf type2 keyword)	[PWG5100.7]
2034	document-format-details-default(obsolete) (collection)	[PWG5100.7]
2035	document-format-details-supported(obsolete) (1setOf keyword)	[PWG5100.7]
2036	document-format-version-default(obsolete) (text(127))	[PWG5100.7]
2037	document-format-version-supported(obsolete) (1setOf text(127))	[PWG5100.7]
2038	document-natural-language-default (naturalLanguage)	[PWG5100.7]
2039	document-natural-language-supported (1setOf naturalLanguage)	[PWG5100.7]
2040	job-copies-default(obsolete) (integer(1:MAX))	[PWG5100.7]
2041	job-copies-supported(obsolete) (rangeOfInteger(1:MAX))	[PWG5100.7]
2042	job-cover-back-default(obsolete) (collection)	[PWG5100.7]
2043	job-cover-back-supported(obsolete) (1setOf keyword)	[PWG5100.7]
2044	job-cover-front-default(obsolete) (collection)	[PWG5100.7]
2045	job-cover-front-supported(obsolete) (1setOf keyword)	[PWG5100.7]
2046	job-finishings-col-default(obsolete) (1setOf collection)	[PWG5100.7]
2047	job-finishings-col-ready(obsolete) (1setOf collection)	[PWG5100.7]
2048	job-finishings-col-supported(obsolete) (1setOf keyword)	[PWG5100.7]
2049	job-finishings-default(obsolete) (1setOf type2 enum)	[PWG5100.7]
2050	job-finishings-ready(obsolete) (1setOf type2 enum)	[PWG5100.7]
2051	job-finishings-supported(obsolete) (1setOf type2 enum)	[PWG5100.7]
2052	output-device-supported (1setOf name(127))	[PWG5100.7]
2053	print-content-optimize-default (type2 keyword)	[PWG5100.7]
2054		
2055		
2056		
2057		
2058		

2059 [print-content-optimize-supported \(1setOf type2 keyword\)](#) [PWG5100.7]

2060 13.2 Attribute Value Registrations

2061 The keyword values defined in this specification will be published by IANA according to the
2062 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2063 <http://www.iana.org/assignments/ipp-registrations>

2064 The registry entries will contain the following information:

2065	Attributes (attribute syntax)		Reference
2066	Keyword	Attribute Value	
2067	-----	-----	-----
2068	job-state-reasons (1setOf type2 keyword)		[RFC8011]
2069	digital-signature-did-not-verify		[PWG5100.7]
2070	digital-signature-type-not-supported (obsolete)		[PWG5100.7]
2071	errors-detected		[PWG5100.7]
2072	job-digital-signature-wait (obsolete)		[PWG5100.7]
2073	warnings-detected		[PWG5100.7]
2074			
2075	media (type2 keyword name(MAX))		[RFC8011]
2076	choice iso a4 210x297mm na letter 8.5x11in		[PWG5100.7]
2077			
2078	print-content-optimize (type2 keyword)		[PWG5100.7]
2079	graphics		[PWG5100.7]
2080	photo		[PWG5100.7]
2081	text		[PWG5100.7]
2082	text-and-graphics		[PWG5100.7]
2083	print-content-optimize-actual (1setOf type2 keyword)		[PWG5100.7]
2084	<Any "print-content-optimize" value>		[PWG5100.7]
2085	print-content-optimize-default (type2 keyword)		[PWG5100.7]
2086	<Any "print-content-optimize" value>		[PWG5100.7]
2087	print-content-optimize-supported (1setOf type2 keyword)		[PWG5100.7]
2088	<Any "print-content-optimize" value>		[PWG5100.7]
2089			

2090 **13.3 Operation Registrations**

2091 The operations defined in this specification will be published by IANA according to the
2092 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2093 <http://www.iana.org/assignments/ipp-registrations>

2094 The registry entries will contain the following information:

2095	Operation Name	Reference
2096	-----	-----
2097	Create-Job (Extension)	[PWG5100.7]
2098	Print-Job (Extension)	[PWG5100.7]
2099	Print-URI (Extension)	[PWG5100.7]
2100	Send-Document (Extension)	[PWG5100.7]
2101	Send-URI (Extension)	[PWG5100.7]
2102	Validate-Job (Extension)	[PWG5100.7]

2103 **13.4 Status Code Registrations**

2104 The status codes defined in this specification will be published by IANA according to the
2105 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2106 <http://www.iana.org/assignments/ipp-registrations>

2107 The registry entries will contain the following information:

2108	Value	Status Code Name	Reference
2109	-----	-----	-----
2110	0x0500:0x05FF - Server Error:		
2111	0x050B	server-error-too-many-jobs	[PWG5100.7]
2112	0x050C	server-error-too-many-documents	[PWG5100.7]

2113

2114 **14. Overview of Changes**

2115 **14.1 IPP Job Extensions v1.1**

2116 [The following changes were made to PWG 5100.7-2003: Standard for the Internet Printing](#)
2117 [Protocol \(IPP\): Job Extensions \[PWG5100.7\]:](#)

- 2118 [• A rationale section was added, including use cases, exceptions, and requirements;](#)
- 2119 [• References now point to the current versions of dependent documents and](#)
2120 [specifications at the time of publication;](#)
- 2121 [• Read-only attributes are now defined and registered as status attributes;](#)
- 2122 [• The "document-charset" operation attribute and corresponding operation semantics](#)
2123 [are now defined in PWG 5100.5: IPP Document Object v1.1;](#)
- 2124 [• The "document-digital-signature" operation attribute and corresponding Document](#)
2125 [Status, Job Status, and Printer Description attributes have been made obsolete;](#)
- 2126 [• The "document-format-details" operation attribute and corresponding Document](#)
2127 [Status, Job Status, and Printer Description attributes have been made obsolete;](#)
- 2128 [• The "document-format-version" operation attribute and corresponding Document](#)
2129 [Status, Job Status, and Printer Description attributes have been made obsolete;](#)
- 2130 [• The "job-copies" Job Template attribute and corresponding Job Status and Printer](#)
2131 [Description attributes have been made obsolete;](#)
- 2132 [• The "job-cover-back" Job Template attribute and corresponding Job Status and](#)
2133 [Printer Description attributes have been made obsolete;](#)
- 2134 [• The "job-cover-front" Job Template attribute and corresponding Job Status and](#)
2135 [Printer Description attributes have been made obsolete;](#)
- 2136 [• The "job-finishings" Job Template attribute and corresponding Job Status and Printer](#)
2137 [Description attributes have been made obsolete;](#)
- 2138 [• The "job-finishings-col" Job Template attribute and corresponding Job Status and](#)
2139 [Printer Description attributes have been made obsolete; and](#)
- 2140 [• The 'digital-signature-type-not-supported' and 'job-digital-signature-wait' values for](#)
2141 [the "job-state-reasons" attribute have been made obsolete.](#)

2142 **15. References**2143 **15.1 Normative References**

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2192

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2202 ipp@pwg.org (subscribers only)

2203 To subscribe, see the PWG web page:

2204 <http://www.pwg.org/>

2205 Implementers of this specification document are encouraged to join the IPP Mailing List in
2206 order to participate in any discussions of clarification issues and review of registration
2207 proposals for additional attributes and values.

2208 The editors would like to especially thank the following individuals who also contributed
2209 significantly to the development of this document:

2210 Tom Hastings (author of v1.0)
2211 Peter Zehler (author of v1.0)
2212

Deleted: <#>Annex A: Additional requirements for a revision of the PWG 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 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:
<#>The ABNF will be extended to define the 'choice_' prefix to introduce a list of choices of self describing names.
<#>Following the 'choice_' prefix will be two or more fully self describing names, including all three fields.
<#>The order of the list of fully self describing names MUST be in alphabetic order, so that there is only one canonical order for each list of choices.
<#>Printer MAY support dynamic combinations of supported values or MAY support the entire choice value as a conventional keyword which it simply matches for validation purposes.
<#>Printer MUST map the choice value to a particular supported value when selecting the actual media for marking.
<#>If the Printer supports a 'choice_xxx' "media" attribute value and the "media-ready" Printer attribute, the Printer MUST include the 'choice_xxx' value in its "media-ready" Printer attribute as well as the currently loaded value(s) when at least one of the members of a choice value is ready. For example, if 'iso_a4_210x297mm' is loaded, then the "media-ready" Printer attribute MUST include the 'iso_a4_210x297mm' and the 'choice_iso_a4_210x297mm_na_letter_8.5x11in' values.
<#>

2258 **17. Change History**

2259 **[17.1 September 26, 2018](#)**

- 2260
 - [Brought back the job-mandatory-attributes operation attribute, which is still needed.](#)
- 2261
 - [Added a rationale, use case, and design requirement for selective fidelity/job-](#)
- 2262
 - [mandatory-attributes.](#)
- 2263
 - [Added Additional Semantics and Operation Registrations sections for using job-](#)
- 2264
 - [mandatory-attributes with job creation/validation operations.](#)
- 2265
 - [Added Additional Semantics and Operation Registrations sections for returning the](#)
- 2266
 - [too-many-jobs/documents status codes.](#)

2267 **[17.2 September 25, 2018](#)**

2268 Initial revision.

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