



The Printer Working Group

October 22, 2018  
Working Draft

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## IPP Document Object v1.1 (DOCOBJECT)

Status: Interim

Abstract: This specification defines the IPP Document object and its associated attributes, values, group, and operations.

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-ippdocobject11-20181022.docx>

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67 a stable, well understood, and technically competent specification that is widely used with  
68 multiple independent and interoperable implementations. Printer manufacturers and  
69 vendors of printer related software benefit from the interoperability provided by voluntary  
70 conformance to these standards.

71 For additional information regarding the Printer Working Group visit:

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## 176 **1. Introduction**

177 This specification extends the Internet Printing Protocol/1.1 [STD92] by defining the IPP  
178 Document object and its associated attributes, values, group, and operations. The IPP Job  
179 object is extended to contain zero or more addressable Document objects representing the  
180 Documents submitted for and operated on by the Job.

181 This specification obsoletes portions of the previous version of this specification  
182 [PWG5100.5-2003]. A list of changes can be found in section 15.

## 183 **2. Terminology**

### 184 **2.1 Conformance Terminology**

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

### 190 **2.2 Printing Terminology**

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

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

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

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

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

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

## 203 **2.3 Protocol Role Terminology**

204 This specification also defines the following protocol roles to specify unambiguous  
205 conformance requirements:

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

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

## 211 **2.4 Other Terminology**

212 *Attribute Precedence*: The rules which dictate which attribute value takes precedence when  
213 the same attribute is supplied at different points in the workflow with different values, such  
214 as at both the Job Level and the Document Level.

215 *Document Creation Operation*: Operations that create Document objects including Print-Job,  
216 Print-URI, Send-Document, and Send-URI as defined in the IPP/1.1 Model and Semantics  
217 [STD92].

218 *Document Level*: Operation and Document Template attributes supplied in the Send-  
219 Document and Send-URI operations are referred to as being supplied at the Document  
220 Level. Attributes supplied in the Print-Job and Print-URI operations are considered as being  
221 supplied at the Job Level only, *not* also at the Document Level, even though Print-Job and  
222 Print-URI also create Document objects.

223 *Document Template*: An attribute that the Client supplies in a Send-Document or Send-URI  
224 request in the Document attributes group, e.g., “media”.

225 *Honor*: A Printer is said to honor an attribute supplied by the Client if the Printer supports  
226 the attribute and supplied value and conforms to the defined semantics.

227 *Job Creation Operation*: Operations that create Job objects including Create-Job, Print-Job,  
228 and Print-URI as defined in the IPP/1.1 Model and Semantics [STD92].

229 *Job Level*: Operation and Job Template attributes supplied in Print-Job, Print-URI, and  
230 Create-Job requests are referred to as being supplied at the Job Level.

## 231 **2.5 Acronyms and Organizations**

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



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

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

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

## 236 **3. Requirements**

### 237 **3.1 Rationale**

238 The Internet Printing Protocol/1.1 [STD92] defines the IPP Model and Semantics, including  
239 abstract objects for a Printer that processes Jobs and the Jobs themselves which process  
240 Documents. Given the need to directly address Documents in a Job, the IPP Document  
241 Object v1.1 should:

- 242 1. Define an abstract IPP Document object and its attributes;
- 243 2. Define new IPP operations for the IPP Document object; and
- 244 3. Extend existing IPP operations as needed to support the IPP Document object.

### 245 **3.2 Use Cases**

#### 246 **3.2.1 Specify Per-Document Print Intent**

247 Jane is printing a multi-volume report and would like the output printed together. She uses  
248 an application on her computer to select each volume in the report and a shipping envelope.  
249 She then initiates a print action, specifying the media and finishing processes for each  
250 volume and the media for the shipping envelope. The printer processes all of the documents  
251 as a single job, placing the hardcopy output in a mailbox together.

#### 252 **3.2.2 See a List of Documents in a Job**

253 John has submitted a multi-document job to a printer but cannot remember if he included all  
254 of the documents needed. He uses an application on his mobile device to query the list of  
255 documents in the print job and display them on the screen.

#### 256 **3.2.3 Cancel a Single Document**

257 Bob has submitted a multi-document job to a printer but realizes there was a typographical  
258 error in one of the documents that has not yet printed. He uses an application on his

259 computer to view the list of jobs on the printer, views the list of documents in the job he  
260 submitted, and initiates a cancel action for the document containing the error.

### 261 **3.3 Exceptions**

262 There are no exceptions defined for this specification.

### 263 **3.4 Out of Scope**

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

- 265 1. Definition of copy or page level semantics; and
- 266 2. Definition of per-page or per-copy overrides.

### 267 **3.5 Design Requirements**

268 The design requirements for this specification are:

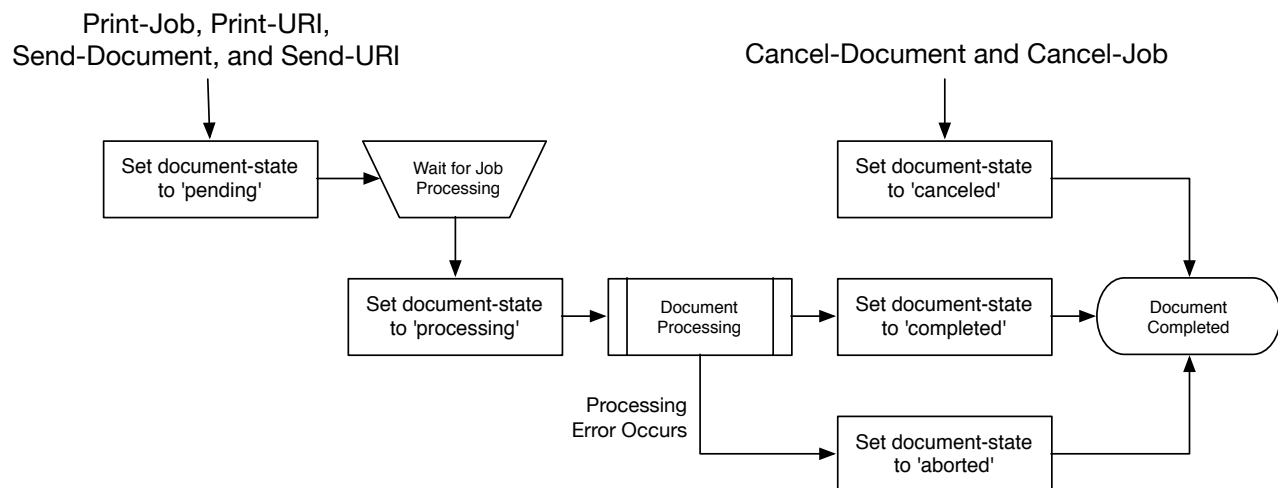
- 269 1. Define an abstract IPP Document object and its semantics;
- 270 2. Define an attribute group tag for attributes of an IPP Document object;
- 271 3. Define attributes and values to describe an IPP Document object;
- 272 4. Define operations for querying and manipulating IPP Document objects;
- 273 5. Extend existing operations to explicitly create IPP Document objects;
- 274 6. Define security requirements necessary to support IPP Document objects; and
- 275 7. Define sections to register all objects, attribute groups, attributes, values, and
- 276 operations with IANA.
- 277

## 278 4. Model

279 The Internet Printing Protocol/1.1 [STD92] defines an object model containing a Printer that  
 280 processes Jobs and a Job that processes Documents. This specification extends the Model  
 281 with an addressable Document object with its own attributes and state. Printers MAY support  
 282 multiple Documents per Job.

### 283 4.1 Document Object

284 The Document object represents a single Document in a Job that contains Document-  
 285 specific Description, Status, and Template attributes. Document Description attributes  
 286 provide information about the Document, Document Status attributes provide state  
 287 information for the Document, and Document Template attributes override the  
 288 corresponding Job Template attributes for the Document. A Document object also contains  
 289 the Document data and/or a URI that references the Document data. Figure 1 shows the life  
 290 cycle of the Document object.



291

292

Figure 1 - Document Object Life Cycle

## 293 4.2 Operations

294 The Print-Job and Print-URI operations [STD92] create a Job object containing a single  
 295 Document object while the Create-Job operation [STD92] creates a Job object with no  
 296 Document objects. The Send-Document and Send-URI operations [STD92] add Document  
 297 objects to the specified Job object. Printers conforming to this specification MUST support  
 298 the Create-Job and Send-Document operations.

299 This specification extends the Send-Document and Send-URI operations to accept  
 300 Document Template attributes in the Document Attributes group. The Document Template

301 attributes are applied to the Document object being created, overriding any corresponding  
 302 Job Template attributes supplied at the Job Level which allows the Client to vary the  
 303 Document Template attributes between Document objects in a single Job.

304 This specification also defines one new Job operation and four new Document operations.  
 305 Table 1 lists the operations and their conformance requirements.

306

**Table 1 - IPP Operations**

<b>Operation</b>	<b>Target</b>	<b>Conformance</b>	<b>Reference</b>
Cancel-Document	Document	MUST	Section 5.1.1
Create-Job	Printer	MUST	STD 92
Get-Document-Attributes	Document	MUST	Section 5.1.2
Get-Documents	Job	MUST	Section 5.2.1
Print-Job	Printer	MUST	STD 92, Section 8.3
Print-URI	Printer	MAY	STD 92, Section 8.3
Send-Document	Job	MUST	STD 92, Section 8.4
Send-URI	Job	MAY	STD 92, Section 8.5
Set-Document-Attributes	Document	MAY	Section 5.1.3

### 307 **4.3 Job and Document Template Attributes**

308 Clients OPTIONALLY supply Job Template attributes in Create-Job, Print-Job, and Print-  
 309 URI requests, and OPTIONALLY supply Document Template attributes in Print-Job, Print-  
 310 URI, Send-Document, and Send-URI requests. Job Template attributes apply to the Job as  
 311 a whole. Document Template attributes apply only to the corresponding Document object.

312 Printers MUST support the following Attribute Precedence from highest to lowest when  
 313 processing a Document:

- 314 1. Document Level - The Document Template attributes supplied in the Document  
 315 Creation request or a subsequent Set-Document-Attributes request;
- 316 2. Job Level - The Job Template attributes supplied in the Job Creation request or  
 317 a subsequent Set-Job-Attributes request; and
- 318 3. Printer Default - The Printer Default attributes as supplied by the manufacturer  
 319 or configured by the operator or administrator using a Set-Printer-Attributes  
 320 request.

321 Note: Depending on the value of the "pdl-override-supported" Printer Description attribute  
 322 [STD92], device commands embedded in the Document data could override attributes  
 323 specified at any of the previous levels.

## 324 **5. New Operations**

325 This section defines the new IPP operations for this specification.

326 Note: The Internet Printing Protocol/1.1 [STD92] deprecates the "job-uri" operation attribute  
327 for specifying the target Job and recommends that Clients send the "printer-uri" and "job-id"  
328 operation attributes instead.

### 329 **5.1 Document Operations**

#### 330 **5.1.1 Cancel-Document**

331 This REQUIRED Document operation allows a Client to cancel a specified Document in a  
332 specified Print Job any time from the time the Document is created up to, but not including,  
333 the time that the Document is completed, canceled, or aborted. Since a Document might  
334 already be printing by the time a Cancel-Document request is received, some media sheet  
335 pages might be printed before the Document processing is actually terminated.

336 The Cancel-Document operation does not remove the Document from the Job and Printer,  
337 but only sets the specified Document's "document-state" Document Status attribute to  
338 'canceled' and the Document's "document-state-reasons" Document Status attribute with  
339 'canceled-by-user' or 'canceled-by-operator'. If the Job object is printed again using  
340 operations such as Resubmit-Job [PWG5100.11], any canceled Documents are also printed  
341 again. Thus Cancel-Document has the same semantics as Cancel-Job [STD92] which only  
342 cancels the processing of the Job and doesn't delete the Job object itself.

343 The Printer MUST accept or reject the request based on the Document's current state and  
344 transition the Document to the indicated new state as shown in Table 2.

345 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can  
346 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-  
347 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as  
348 appropriate.

349

350

**Table 2 - Document State Transitions for Cancel-Document**

<b>Current "document-state"</b>	<b>New "document-state"</b>	<b>Printer's response status code and action:</b>
'pending'	'canceled'	'successful-ok'
'processing'	'canceled'	'successful-ok'
'processing'	'processing'	'successful-ok' (note 1)
'processing'	'processing'	'client-error-not-possible' (note 2)
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

351 Note 1: If the implementation requires some measurable time to cancel the  
 352 Document in the 'processing' state, the Printer MUST add the 'processing-to-stop-  
 353 point' value to the Document's "document-state-reasons" attribute and then  
 354 transition the Document to the 'canceled' state when the processing ceases.

355 Note 2: If the Document object already has the 'processing-to-stop-point' value in its  
 356 "document-state-reasons" attribute, then the Printer MUST reject the Cancel-  
 357 Document request.

### 358 5.1.1.1 Cancel-Document Request

359 The following groups of attributes are part of the Cancel-Document request:

360 Group 1: Operation Attributes

361 Natural Language and Character Set:

362 The "attributes-charset" and "attributes-natural-language" attributes as  
 363 described in [STD92].

364 Target:

365 Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"  
 366 (uri) operation attribute(s) [STD92] which define the target Job object for this  
 367 operation, followed by the "document-number" (integer(1:MAX)) operation  
 368 attribute which defines the target Document object for this operation. If the  
 369 Client omits the "document-number" operation attribute, the Printer MUST  
 370 reject the request and return the 'client-error-bad-request' status code.

371 Requesting User Name:

372 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by  
 373 the Client as described in [STD92].

374 "document-message" (text(MAX)):

375 The Client MAY supply this attribute. If supported by the Printer, the Printer  
376 MUST also support the corresponding "document-message" (text(MAX))  
377 Document Status attribute (see section ???) and copy the value to the  
378 Document's "document-message" attribute.

### 379 **5.1.1.2 Cancel-Document Response**

380 The following groups of attributes are part of the Cancel-Document response:

381 Group 1: Operation Attributes

382 Status Message:

383 In addition to the REQUIRED status code returned in every response, the  
384 response OPTIONALLY includes a "status-message" (text(255)) and/or a  
385 "detailed-status-messages" (text(MAX)) Operation attribute as described in  
386 [STD92].

387 Natural Language and Character Set:

388 The "attributes-charset" and "attributes-natural-language" attributes as  
389 described in [STD92].

390 Group 2: Unsupported Attributes

391 See [STD92] for details on returning Unsupported Attributes.

### 392 **5.1.2 Get-Document-Attributes**

393 This REQUIRED Document operation allows a Client to request the values of selected  
394 attributes of a Document object. The Printer MUST only return attributes that were submitted  
395 by a Client or generated by the Printer.

396 The Client requests attributes using the "requested-attributes (keyword)" operation attribute  
397 [STD92] which lists the attribute names and groups of interest. For Document objects the  
398 possible names of attribute groups are:

399 'document-template': The subset of Document Template that the implementation  
400 supports for Document objects.

401 'document-description': The subset of Document Description and Document Status  
402 attributes that the implementation supports for Document objects.

403 'all': All attributes that the implementation supports for Document objects.

404 Since a Client MAY request specific attributes or named groups, there is a potential that  
405 there is some overlap. For example, if a Client requests 'document-name' and 'document-  
406 description', the Client is actually requesting the "document-name" attribute once by naming  
407 it explicitly and once by inclusion in the 'document-description' group. In such cases, the  
408 Printer returns the attribute only once in the response even if it is requested multiple times.  
409 The Client SHOULD NOT request the same attribute in multiple ways.

410 Printers MUST support all group names and MUST return all supported attributes belonging  
411 to the group.

412 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can  
413 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-  
414 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as  
415 appropriate.

### 416 **5.1.2.1 Get-Document-Attributes Request**

417 The following groups of attributes are part of the Get-Document-Attributes request:

418       Group 1: Operation Attributes

419               Natural Language and Character Set:

420               The "attributes-charset" and "attributes-natural-language" attributes as  
421               described in [STD92].

422               Target:

423               Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"  
424               (uri) operation attribute(s) [STD92] which define the target Job object for this  
425               operation, followed by the "document-number" (integer(1:MAX)) operation  
426               which defines the target Document object for this operation. If the Client  
427               omits the "document-number" operation attribute, the Printer MUST reject the  
428               request and return the 'client-error-bad-request' status code.

429               Requesting User Name:

430               The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by  
431               the Client as described in [STD92].

432               "requested-attributes" (1setOf keyword):

433               The Client OPTIONALLY supplies and the Printer MUST support this  
434               attribute, which is a list of Document attribute names and/or attribute group  
435               names that are returned to the Client for each Document object. If the Client  
436               does not supply this attribute, the Printer MUST respond as if the Client had  
437               supplied this attribute with the single value 'all'.



### 438 5.1.2.2 Get-Document-Attributes Response

439 The following groups of attributes are part of the Get-Document-Attributes response:

440 Group 1: Operation Attributes

441 Status Message:

442 In addition to the REQUIRED status code returned in every response, the  
443 response OPTIONALLY includes a "status-message" (text(255)) and/or a  
444 "detailed-status-messages" (text(MAX)) Operation attribute as described in  
445 [STD92].

446 Natural Language and Character Set:

447 The "attributes-charset" and "attributes-natural-language" attributes as  
448 described in [STD92]. The "attributes-natural-language" MAY be the natural  
449 language of the Document object rather than the one in the Get-Document-  
450 Attributes request.

451 Group 2: Unsupported Attributes

452 See [STD92] for details on returning Unsupported Attributes.

453 The response MAY contain the "requested-attributes" operation attribute with  
454 any supplied values (attribute keywords) that were requested by the Client  
455 but are not supported by the Printer. If the Printer does return unsupported  
456 attributes referenced in the "requested-attributes" operation attribute and that  
457 attribute included group names such as 'all', the unsupported attributes  
458 MUST NOT include attributes described in the standard but not supported by  
459 the implementation.

460 Group 3: Document Attributes

461 The Printer responds with the Document Description, Document Status, and  
462 Document Template attributes for each returned Document object as  
463 requested by the "requested-attributes" operation attribute supplied by the  
464 Client in the request. The Printer ignores (does not respond with) any  
465 requested attribute or value which is not supported or which is restricted by  
466 the security policy in force, including whether the requesting user is the Job  
467 owner. However, the Printer MUST respond with the 'unknown' out of band  
468 value [STD92] for any supported attribute (including all REQUIRED  
469 attributes) for which the Printer does not know the value, unless it would  
470 violate the security policy.

### 471 5.1.3 Set-Document-Attributes

472 This OPTIONAL Document operation allows a Client to set the values of the attributes of a  
 473 Document object after the Document object is submitted to the Printer. In the request, the  
 474 Client supplies the set of Document attributes and values that are to be set. In the response,  
 475 the Printer returns success or rejects the entire request with indications of which attribute or  
 476 attributes could not be set.

477 This operation is similar to the Set-Job-Attributes operation [RFC3380] and follows the same  
 478 rules for validation. As with the Set-Job-Attributes operation, the Set-Document-Attributes  
 479 operation can add a new attribute, replace the value of an existing attribute, or remove an  
 480 attribute using 'delete-attribute' out-of-band value.

481 If the Client supplies an attribute in a Set-Document-Attributes request with the 'delete-  
 482 attribute' out-of-band value and that attribute is not present on the Document object, the  
 483 Printer ignores the attribute and does not return the attribute in the Unsupported Attributes  
 484 group. The Printer also returns the 'successful-ok' status code if there are no other problems  
 485 with the request.

486 The Printer MUST accept or reject this operation when the Document's "document-state"  
 487 attribute has the values shown in ??? but MUST NOT change the state of the Document  
 488 object since the Document is a passive object and the Document state is a subset of the Job  
 489 State. For example, in the case where the operation creates a request for unavailable  
 490 resources, the Job (but not the Document) transitions to a new state.

491 **Table 3 - Allowed Document States for the Set-Document-Attributes operation**

<b>“document-state”</b>	<b>Printer’s response status code and “action”</b>
'pending'	'successful-ok'
'pending'	'successful-ok' - needed resources are not ready (the Job MAY change state)
'processing'	'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the document has started marking media, etc.
'completed'	'client-error-not-possible'
'canceled'	'client-error-not-possible'
'aborted'	'client-error-not-possible'

492 This operation MUST NOT change the value of attributes not specified in the operation  
 493 unless the definition of the attribute explicitly specifies such side effects. In general,  
 494 Document attributes that are settable do not define side effects on other attributes that are  
 495 settable, only side effects on READ-ONLY attributes, if any.

496 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support  
 497 setting of all Document Description and Document Template attributes that the

498 implementation supports. Document Status attributes are READ-ONLY and cannot be set  
499 directly using this operation.

500 Note: There is no way for the Client to set all of a Job's Document objects to the same  
501 attribute values in a single operation. Either a) the Client sets the corresponding attribute in  
502 each Document object in the Job with separate Set-Document-Attributes requests, or b) the  
503 Client sets the corresponding attribute at the Job Level using the Set-Job-Attributes  
504 operation. Setting the corresponding attribute at the Job Level (or supplying that attribute  
505 initially in the Job Creation operation) causes each Document object to inherit the Job Level  
506 attribute value, if the Document object doesn't have a corresponding explicit attribute  
507 supplied at the Document Level. In other words, supplying an attribute at the Job Level will  
508 affect all the Job's Document objects that don't have that attribute also explicitly supplied at  
509 the Document Level.

510 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can  
511 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-  
512 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as  
513 appropriate.

#### 514 **5.1.3.1 Set-Document-Attributes Request**

515 The following groups of attributes are part of the Set-Document-Attributes request:

516       Group 1: Operation Attributes

517               Natural Language and Character Set:

518               The "attributes-charset" and "attributes-natural-language" attributes as  
519               described in [STD92].

520               Target:

521               Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"  
522               (uri) operation attribute(s) [STD92] which define the target Job object for this  
523               operation, followed by the "document-number" (integer(1:MAX)) operation  
524               which defines the target Document object for this operation. If the Client  
525               omits the "document-number" operation attribute, the Printer MUST reject the  
526               request and return the 'client-error-bad-request' status code.

527               Requesting User Name:

528               The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by  
529               the Client as described in [STD92].

530       Group 2: Document Attributes

531 The Client supplies one or more Document Description or Document  
532 Template attributes. If supported, the Printer MUST either add the attribute (if  
533 it does not already exist in the Document object), replace all values for the  
534 attribute (if it already exists in the Document object), or remove the attribute  
535 (if the 'delete-attribute' out-of-band value is supplied by the Client).

### 536 5.1.3.2 Set-Document-Attributes Response

537 The Printer returns the following groups of attributes as part of the Set-Document-Attributes  
538 response:

539 Group 1: Operation Attributes

540 Status Message:

541 In addition to the REQUIRED status code returned in every response, the  
542 response OPTIONALLY includes a "status-message" (text(255)) and/or a  
543 "detailed-status-messages" (text(MAX)) Operation attribute as described in  
544 [STD92].

545 Natural Language and Character Set:

546 The "attributes-charset" and "attributes-natural-language" attributes as  
547 described in [STD92].

548 Group 2: Unsupported Attributes

549 See [STD92] for details on returning Unsupported Attributes.

550 If some of the attributes in the operation fail to validate, the Printer MUST  
551 reject the operation, MUST NOT change any Document attributes, and  
552 MUST return the indicated status code below. In this group, the Printer  
553 MUST also return all attributes that fail to validate. The following are the  
554 reasons that an attribute fails to validate and the value returned for the  
555 attribute, along with the indicated status code and order of detection:

556 1. The number of attributes supplied by the client exceeds the maximum  
557 number that the Printer supports in a Set-Document-Attributes  
558 request: return the 'client-error-request-entity-too-large' status code  
559 [STD92].

560 2. The Printer doesn't support the attribute: return the attribute with the  
561 'unsupported' out-of-band attribute value and the 'client-error-  
562 attributes-or-values-not-supported' status code [STD92].

563 3. The attribute is READ-ONLY (in its definition) or is not-settable in this  
564 implementation: return the attribute with the 'not-settable' out-of-band

- 565 attribute value and the 'client-error-attributes-not-settable' status code  
566 [RFC3380].
- 567 4. The Printer doesn't support the value: if the attribute in the operation  
568 has a single value, return it. If the attribute in the operation is multi-  
569 valued, return only those values in a 1setOf that are not supported.  
570 Return the 'client-error-attributes-or-values-not-supported' status code  
571 [STD92].
- 572 5. The values of some of the supplied attributes conflict with one another  
573 and/or other Document attribute values not being set: if the conflicting  
574 attribute in the operation has a single value, return the attribute and  
575 the value. If the attribute in the operation is multi-valued, return only  
576 the attribute and those values in a 1setOf that are conflicting with  
577 other attributes. Return the 'client-error-conflicting-attributes' status  
578 code [STD92].

## 579 **5.2 Job Operations**

### 580 **5.2.1 Get-Documents**

581 This REQUIRED Job operation allows a Client to retrieve the list of Document objects  
582 belonging to the target Job object. The Client MAY also supply a list of Document attribute  
583 names and/or attribute group names. A group of Document object attributes will be returned  
584 for each Document object in the Job.

585 This operation is similar to the Get-Document-Attributes operation (see section ???), except  
586 that this operation returns attributes from all Document objects contained in the Job object  
587 instead of from a single selected Document object in the Job object. As with the Get-  
588 Document-Attributes operation, the Printer MUST only return attributes that were submitted  
589 by a Client or generated by the Printer.

590 This operation is also similar to the Get-Jobs operation [STD92] except that there are no  
591 equivalents to the “which-jobs” and “my-jobs” operation attributes.

592 It is not an error for the Printer to return 0 Documents. If the response returns 0 Documents  
593 because there are no Documents in the Job, then the status code for 0 Documents MUST  
594 be 'successful-ok'.

595 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can  
596 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-  
597 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as  
598 appropriate.

### 599 **5.2.1.1 Get-Documents Request**

600 The following groups of attributes are part of the Get-Documents request:

601       Group 1: Operation Attributes

602             Natural Language and Character Set:

603             The "attributes-charset" and "attributes-natural-language" attributes [STD92]

604             Target:

605             Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"  
606             (uri) operation attribute(s) [STD92] which define the target Job object for this  
607             operation.

608             Requesting User Name:

609             The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by  
610             the Client as described in [STD92].

611             "limit" (integer(1:MAX)):

612             The client OPTIONALLY supplies and the Printer MUST support this  
613             operation attribute, which determines the maximum number of Documents  
614             that a Client will receive from the Printer. The limit is a "stateless limit" in that  
615             if the value supplied by the Client is 'N', then only the first 'N' Documents are  
616             returned in the Get-Documents Response. There is no mechanism to allow  
617             for the next 'M' Documents after the first 'N' Documents. If the Client does not  
618             supply the "limit" attribute, the Printer responds with all Documents in the  
619             Job.

620             "requested-attributes" (1setOf keyword):

621             The client OPTIONALLY supplies and the Printer MUST support this  
622             attribute, which is a list of Document attribute names and/or attribute group  
623             names that are returned to the Client for each Document object. The allowed  
624             attribute group names are the same as those defined in the Get-Documents-  
625             Attributes operation in section ????. If the Client does not supply this attribute,  
626             the Printer MUST respond as if the Client had supplied this attribute with the  
627             single value 'document-number'.

### 628 **5.2.1.2 Get-Documents Response**

629 The following groups of attributes are part of the Get-Documents request:

630 Group 1: Operation Attributes

631 Status Message:

632 In addition to the REQUIRED status code returned in every response, the  
633 response OPTIONALLY includes a "status-message" (text(255)) and/or a  
634 "detailed-status-messages" (text(MAX)) operation attribute as described in  
635 [STD92].

636 Natural Language and Character Set:

637 The "attributes-charset" and "attributes-natural-language" attributes as  
638 described in [STD92].

639 Group 2: Unsupported Attributes

640 See [STD92] for details on returning Unsupported Attributes.

641 The response MAY contain the "requested-attributes" operation attribute with  
642 any supplied values (attribute keywords) that were requested by the Client  
643 but are not supported by the Printer. If the Printer does return unsupported  
644 attributes referenced in the "requested-attributes" operation attribute and that  
645 attribute included group names such as 'all', the unsupported attributes  
646 MUST NOT include attributes described in the standard but not supported by  
647 the implementation.

648 Groups 3 to N: Document Attributes

649 The Printer responds with the Document Description, Document Status, and  
650 Document Template attributes for each returned Document object as  
651 requested by the "requested-attributes" operation attribute supplied by the  
652 Client in the request. The Printer ignores (does not respond with) any  
653 requested attribute or value which is not supported or which is restricted by  
654 the security policy in force, including whether the requesting user is the Job  
655 owner. However, the Printer MUST respond with the 'unknown' out of band  
656 value [STD92] for any supported attribute (including all REQUIRED  
657 attributes) for which the Printer does not know the value, unless it would  
658 violate the security policy.

659 The Printer MUST return the groups in order of increasing "document-  
660 number" value.

661 **6. New Attributes**662 **6.1 Document Description Attributes**663 **6.1.1 document-name (name(MAX))**

664 This REQUIRED Document Description attribute specifies the name of the document and is  
 665 copied from the "document-name" operation attribute [STD92] supplied by the Client in the  
 666 Document Creation request.

667 **6.2 Document Status Attributes**

668 Table 4 lists the Document Status attributes defined by this specification. Printers that  
 669 support a given operation or Job Status attribute MUST support the corresponding  
 670 Document Status attribute.

671

**Table 4 - Document Status Attributes**

<b>Document Attribute</b>	<b>Operation/Job Attribute</b>	<b>Reference</b>
attributes-charset (charset)	attributes-charset	[STD92]
attributes-natural-language (naturalLanguage)	attributes-natural-language	[STD92]
current-page-order (type2 keyword)	current-page-order	[PWG5100.3]
date-time-at-completed (dateTime)	date-time-at-completed	[STD92]
date-time-at-creation (dateTime)	date-time-at-creation	[STD92]
date-time-at-processing (dateTime)	date-time-at-processing	[STD92]
detailed-status-messages (1setOf text(MAX))	job-detailed-status- messages	[STD92]
document-access-errors (1setOf text(MAX))	job-document-access-errors	[STD92]
document-charset (charset)	document-charset	Sections 6.2.1 and 6.4.1
document-format (mimeType)	document-format	[STD92]
document-format-detected (mimeType)	<none>	Section 6.2.2
document-job-id (integer(1:MAX))	job-id	[STD92]



Document Attribute	Operation/Job Attribute	Reference
document-job-uri (uri)	job-uri	[STD92]
document-message (text(MAX))	<none>	Section 6.2.3
document-natural-language (naturalLanguage)	document-natural-language	[STD92]
document-number (integer(1:MAX))	<none>	Section 6.2.4
document-printer-uri (uri)	job-printer-uri	[STD92]
document-state (type1 enum)	job-state (note 1)	[STD92]
document-state-message (text(MAX))	job-state-message	[STD92]
document-state-reasons (1setOf type2 keyword)	job-state-reasons	[STD92]
document-uri (uri)	document-uri (note 2)	[STD92]
impressions (integer(0:MAX))	job-impressions	[STD92]
impressions-completed (integer(0:MAX))	job-impressions-completed	[STD92]
k-octets (integer(0:MAX))	job-k-octets	[STD92]
k-octets-processed (integer(0:MAX))	job-k-octets-processed	[STD92]
last-document (boolean)	<none>	Section 6.2.5
media-sheets (integer(0:MAX))	job-media-sheets	[STD92]
media-sheets-completed (integer(0:MAX))	job-media-sheets- completed	[STD92]
more-info (uri)	job-more-uri	[STD92]
output-device-assigned (name(MAX))	output-device-assigned	[STD92]
printer-up-time (integer(1:MAX))	job-printer-up-time	[STD92]
time-at-completed (integer(MIN:MAX))	time-at-completed	[STD92]
time-at-creation (integer(MIN:MAX))	time-at-creation	[STD92]
time-at-processing (integer(MIN:MAX))	time-at-processing	[STD92]

672 Note 1: The "document-state" attribute supports all of the "job-state" values *except*  
673 '4' (pending-held).

674 Note 2: The "document-uri" attribute identifies the source location of the Document  
675 data and is not an identifier for the Document object. The simple identifier of the  
676 Document is the "document-number" Document Status attribute.

**677 6.2.1 document-charset (charset)**

678 This RECOMMENDED Document Status attribute specifies the charset used in the  
679 Document data. The Printer sets this attribute from the corresponding operation attribute  
680 supplied by the Client in the Document Creation request. Printers that support the  
681 "document-charset" operation attribute MUST support this attribute.

**682 6.2.2 document-format-detected (mimeMediaType)**

683 This Document Status attribute is generated by the Printer to indicate the format of the  
684 Document object content as detected by the Printer.

**685 6.2.3 document-message (text(MAX))**

686 This Document Status attribute contains a message from either a) the User to the Operator  
687 about the Document or b) from the Operator, Administrator, or "intelligent" process to  
688 indicate to the End User the reasons for modification or other management action taken on  
689 the Document. The Printer populates this attribute from the "document-message" operation  
690 attribute value supplied by the Client in any of the Document Creation requests or in a  
691 Cancel-Document request.

**692 6.2.4 document-number (integer(1:MAX))**

693 This REQUIRED Document Status attribute is the ordinal number of the Document within  
694 the Job, and determines its order of being printed in a multi-Document Job. The Printer  
695 MUST generate the values monotonically increasing from 1 for each Job.

**696 6.2.5 last-document (boolean)**

697 This REQUIRED Document Status attribute indicates whether this Document is the last  
698 Document in the Job [STD92]. The Printer sets this attribute from the corresponding  
699 operation attribute supplied by the Client in the Document Creation request, when the Client  
700 sends a Close-Job request [PWG5100.11], or when the "multiple-operation-time-out" time  
701 interval has passed.

**702 6.3 Document Template Attributes**

703 This specification defines Document Template attributes for every Job Template attribute  
704 that does not apply to the whole Job. Table 5 lists the new attributes.

705 **Table 5 - Document Template Attributes**

Attribute	Reference
copies (integer(1:MAX))	[STD92]
cover-back (collection)	[PWG5100.3]
cover-front (collection)	[PWG5100.3]
finishings (1setOf type2 enum)	[STD92]
finishings-col (1setOf collection)	[PWG5100.1]
force-front-side (1setOf integer(1:MAX))	[PWG5100.3]
imposition-template (type2 keyword   name(MAX))	[PWG5100.3]
media (type2 keyword   name(MAX))	[STD92]
media-col (collection)	[PWG5100.3]
media-input-tray-check (type2 keyword   name(MAX))	[PWG5100.3]
number-up (integer(1:MAX))	[STD92]
orientation-requested (type2 enum)	[STD92]
output-bin (type2 keyword   name(MAX))	[PWG5100.2]
page-delivery (type2 keyword)	[PWG5100.3]
page-order-received (type2 keyword)	[PWG5100.3]
page-ranges (1setOf rangeOfInteger(1:MAX))	[STD92]
presentation-direction-number-up (type2 keyword)	[PWG5100.3]
print-quality (type2 enum)	[STD92]
printer-resolution (resolution)	[STD92]
sides (type2 keyword)	[STD92]
x-image-position (type2 keyword)	[PWG5100.3]
x-image-shift (integer(MIN:MAX))	[PWG5100.3]
x-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
x-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-image-position (type2 keyword)	[PWG5100.3]
y-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]

## 706 6.4 Operation Attributes

### 707 6.4.1 document-charset (charset)

708 This RECOMMENDED operation attribute specifies the character set used by the Document  
709 data.

### 710 6.4.2 document-number (integer(1:MAX))

711 This REQUIRED operation attribute specifies the ordinal number of the Document within the  
712 Job.

## 713 **6.5 Printer Description Attributes**

### 714 **6.5.1 document-creation-attributes-supported (1setOf type2 keyword)**

715 This REQUIRED attribute lists the keyword names of the Document Template and operation  
716 attributes that the Printer will accept in the Send-Document and Send-URI Document  
717 Creation operations. Implementations that support the Send-URI operation MUST include  
718 the ‘document-uri’ keyword in “document-creation-attributes-supported”. Implementations  
719 that do not support Send-URI MUST NOT include the ‘document-uri’ keyword in “document-  
720 creation-attributes-supported”.

721 Note: The “document-uri” attribute is specific to the Send-URI operation. Inclusion of the  
722 ‘document-uri’ keyword in “document-creation-attributes-supported” does not imply that the  
723 “document-uri” attribute is valid for the Send-Document operation.

## 724 **7. New Attribute Group Tags**

### 725 **7.1 document-attributes-tag**

726 The document-attributes-tag (0x09) attribute group tag is used to delimit Document object  
727 attributes in IPP messages.

728

## 729 8. Additional Semantics for Existing Operations

### 730 8.1 Cancel-Job: "document-state" and "document-state-reasons"

731 This REQUIRED operation sets the "document-state" Document Status attribute to  
 732 'canceled' and the "document-state-reasons" Document Status attribute with 'canceled-by-  
 733 user' or 'canceled-by-operator' for *all* Document objects in the identified Job that have not  
 734 yet reached a terminating state ('completed', 'canceled', or 'aborted').

### 735 8.2 Hold-Job and Release-Job: "document-state-reasons"

736 These OPTIONAL operations affect the state of the target Job. The values of the  
 737 Documents' "document-state-reasons" Document Status attributes MUST NOT be affected  
 738 by these operations.

### 739 8.3 Print-Job, Print-URI: Document Object and Attributes

740 This specification extends the REQUIRED Print-Job and OPTIONAL Print-URI operations  
 741 [STD92] to explicitly create a Document object and copy the request operation attributes  
 742 listed in Table 6 to the corresponding Document attributes. Printers MUST NOT copy Job  
 743 Template attributes to the created Document object.

744 Printers can also return the attributes listed in Table 7 in the Document attributes group after  
 745 the Job attributes group.

746 **Table 6 - Operation Attributes Copied to Document Objects**

Operation Attribute	Document Attribute	Reference
attributes-charset	attributes-charset	[STD92]
attributes-natural-language	attributes-natural-language	[STD92]
document-charset	document-charset	Sections 6.2.1 and 6.4.1
document-format	document-format	[STD92]
	document-format-detected	Section 6.2.2
document-message	document-message	Section 6.2.3
document-name	document-name	[STD92]
document-natural-language	document-natural-language	[STD92]
document-uri	document-uri	[STD92]
job-impressions	impressions	[STD92], Section 6.2.3
job-k-octets	k-octets	[STD92], Section <b>Error!</b> <b>Reference source not found.</b>

Operation Attribute	Document Attribute	Reference
job-media-sheets	media-sheets	[STD92], Section <b>Error!</b> <b>Reference source not found.</b>

747 Editor's note: The following attributes have been omitted from the table since they will have  
 748 been deprecated since the publication of v1.0: "document-digital-signature", "document-  
 749 format-details", and "document-format-version". Also, the "compression", "ipp-attribute-  
 750 fidelity", and "job-mandatory-attributes" have been omitted since they are only evaluated at  
 751 the time of Job/Document creation.

752 **Table 7 - Returned Document Status Attributes**

Document Status Attribute	Print-xxx Conformance	Send-xxx Conformance	Reference
document-number	OPTIONAL	REQUIRED	Section 6.2.4
document-state	OPTIONAL	REQUIRED	Section <b>Error!</b> <b>Reference source not found.</b>
document-state-message	OPTIONAL	OPTIONAL	Section <b>Error!</b> <b>Reference source not found.</b>
document-state-reasons	OPTIONAL	REQUIRED	Section <b>Error!</b> <b>Reference source not found.</b>

### 753 8.3.1 Print-Job/Print-URI Response

754 The following sets of attributes are part of the Print-Job and Print-URI responses:

755 Group 1: Operation Attributes

756 As specified in [STD92].

757 Group 2: Unsupported Attributes

758 As specified in [STD92].

759 Group 3: Job Object Attributes

760 As specified in [STD92].

761 Group 4: Document Object Attributes (new)

762 "document-number" (integer(1:MAX)):

763 The Printer MAY return the number of this Document object that was  
764 assigned by the Printer starting with 1 for each Job.

765 "document-state" (type1 enum):

766 The Printer MAY return the state of this Document object.

767 "document-state-reasons" (1setOf type2 keyword):

768 The Printer MAY return the associated state reasons for this Document.

769 "document-state-message" (text(MAX)):

770 The Printer MAY return the localized description of the "document-state" and  
771 "document-state-reasons" values for this Document.

## 772 **8.4 Send-Document: Document Object and Attributes**

773 This specification extends the REQUIRED Send-Document operation [STD92] to explicitly  
774 create a Document object and copy the operation attributes listed in Table 6 to the  
775 corresponding Document attributes.

776 The Send-Document request is also extended to support an additional Document Template  
777 attribute group after the operation attribute group. Document Template attributes are copied  
778 to the Document object after validation as described in section 4.3. Printers MUST NOT  
779 copy Document Template attributes to the Job object.

780 Finally, Printers also return the attributes listed in Table 7 in the Document attributes group  
781 after the Job attributes group.

### 782 **8.4.1 Send-Document Request**

783 The following attribute sets are part of the Send-Document request:

784 Group 1: Operation Attributes

785 As specified in [STD92].

786 Group 2: Document Template Attributes (new)

787 The Client OPTIONALLY supplies and the Printer MUST support a set of  
788 Document Template attributes. If the Client is not supplying any Document  
789 Template attributes in the request, the Client SHOULD omit Group 2 rather

790 than sending an empty group. However, a Printer MUST be able to accept  
791 an empty group.

792 Group 3: Document Data

793 As specified in [STD92].

#### 794 **8.4.2 Send-Document Response**

795 The following sets of attributes are part of the Send-Document response:

796 Group 1: Operation Attributes

797 As specified in [STD92].

798 Group 2: Unsupported Attributes

799 As specified in [STD92].

800 Group 3: Job Object Attributes

801 As specified in [STD92].

802 Group 4: Document Object Attributes (new)

803 "document-number" (integer(1:MAX)):

804 The Printer MUST return the number of this Document object that was  
805 assigned by the Printer starting with 1 for each Job.

806 "document-state" (type1 enum):

807 The Printer MUST return the state of this Document object.

808 "document-state-reasons" (1 setOf type2 keyword):

809 The Printer MUST return the associated state reasons for this Document.

810 "document-state-message" (text(MAX)):

811 The Printer MAY return the localized description of the "document-state" and  
812 "document-state-reasons" values for this Document.



## 813 **8.5 Send-URI: Document Object and Attributes**

814 This specification extends the OPTIONAL Send-URI operation [STD92] to explicitly create  
815 a Document object and copy the operation attributes listed in Table 6 to the corresponding  
816 Document attributes.

817 The Send-URI request is also extended to support an additional Document Template  
818 attribute group after the operation attribute group. Document Template attributes are copied  
819 to the Document object after validation as described in section 4.3. Printers MUST NOT  
820 copy Document Template attributes to the Job object.

821 Finally, Printers also return the attributes listed in Table 7 in the Document attributes group  
822 after the Job attributes group.

### 823 **8.5.1 Send-URI Request**

824 The following attribute sets are part of the Send-URI request:

825       Group 1: Operation Attributes

826               As specified in [STD92].

827       Group 2: Document Template Attributes (new)

828               The Client OPTIONALLY supplies and the Printer MUST support a set of  
829               Document Template attributes. If the Client is not supplying any Document  
830               Template attributes in the request, the Client SHOULD omit Group 2 rather  
831               than sending an empty group. However, a Printer MUST be able to accept  
832               an empty group.

### 833 **8.5.2 Send-URI Response**

834 The following sets of attributes are part of the Send-URI response:

835       Group 1: Operation Attributes

836               As specified in [STD92].

837       Group 2: Unsupported Attributes

838               As specified in [STD92].

839       Group 3: Job Object Attributes

840               As specified in [STD92].

841 Group 4: Document Object Attributes (new)

842 "document-number" (integer(1:MAX)):

843 The Printer MUST return the number of this Document object that was  
844 assigned by the Printer starting with 1 for each Job.

845 "document-state" (type1 enum):

846 The Printer MUST return the state of this Document object.

847 "document-state-reasons" (1setOf type2 keyword):

848 The Printer MUST return the associated state reasons for this Document.

849 "document-state-message" (text(MAX)):

850 The Printer MAY return the localized description of the "document-state" and  
851 "document-state-reasons" values for this Document.

## 852 9. Additional Values for Existing Attributes

### 853 9.1 operations-supported (1setOf type2 enum)

854 Table 8 lists the "operation-id" values for the new operations defined in this specification.

855 Table 8 – Operation-id Values

Value	Operation Name	Reference
0x0033	Cancel-Document	Section 5.1.1
0x0034	Get-Document-Attributes	Section 5.1.2
0x0035	Get-Documents	Section 5.2.1
0x0036	Delete-Document (obsolete)	Section 10.1
0x0037	Set-Document-Attributes	Section 5.1.3

### 856 9.2 requested-attributes (1setOf type2 keyword)

857 This specification defines the following additional values for the "requested-attributes"  
858 operation attribute [STD92]:

859 'document-description': All Document Description and Document Status attributes.

860 'document-template': All Document Template and Printer "xxx-supported" attributes.

861

## 862 10. Obsolete Operations and Attributes

### 863 10.1 Obsolete Delete-Document Operation

864 The obsolete Delete-Document operation removes the specified Document object and its  
865 data immediately from the specified Job. This operation is obsolete because it destroys  
866 accounting information about the target Document and MUST NOT be supported by new  
867 implementations of this specification.

### 868 10.2 Obsolete Document Status Attributes

869 Table 9 lists the obsolete Document Status attributes that were defined in the previous  
870 version of this specification [PWG5100.5-2003].

871 Note: This specification does not change the status of the original (non-Document)  
872 attributes.

873 **Table 9 - Obsolete Document Status Attributes**

Attribute	Origin
compression (type2 keyword)	[STD92]
document-digital-signature (type2 keyword)	[PWG5100.7-2003]
document-format-details (1setOf collection)	[PWG5100.7-2003]
document-format-details-detected (1setOf collection)	[PWG5100.7-2003]
document-format-version (text(127))	[PWG5100.7-2003]
document-format-version-detected (text(127))	[PWG5100.7-2003]
impressions-completed-current-copy (integer(0:MAX))	[RFC3381-OBSOLETE]
sheet-completed-copy-number (integer(0:MAX))	[RFC3381-OBSOLETE]

## 874 11. Conformance Requirements

### 875 11.1 Printer Conformance Requirements

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

- 877 1. The required operations defined in section 5;
- 878 2. The required attributes and values defined in section 6;
- 879 3. The new attribute group tag defined in section 7;
- 880 4. The additional semantics defined in section 8;
- 881 5. The additional values defined in section 9;

- 882           6. The internationalization considerations defined in section 12; and  
883           7. The security considerations defined in section 13.

## 884   **11.2 Client Conformance Requirements**

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

- 886           1. The required operations defined in section 5;  
887           2. The required attributes and values defined in section 6;  
888           3. The new attribute group tag defined in section 7;  
889           4. The additional values defined in section 9;  
890           5. The internationalization considerations defined in section 12; and  
891           6. The security considerations defined in section 13.

## 892   **12. Internationalization Considerations**

893   For interoperability and basic support for multiple languages, conforming implementations  
894   **MUST** support:

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

900   Unicode NFC is defined as the result of performing Canonical Decomposition (into base  
901   characters and combining marks) followed by Canonical Composition (into canonical  
902   composed characters wherever Unicode has assigned them).

903   **WARNING** – Performing normalization on UTF-8 strings received from Clients and  
904   subsequently storing the results (e.g., in Job objects) could cause false negatives in Client  
905   searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now  
906   'hidden').

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

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

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

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

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

- 913 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- 914 Unicode Collation Algorithm [UTS10] – sorting
- 915 Unicode Locale Data Markup Language [UTS35] – locale databases
- 916 Implementations of this specification are advised to also review the following informational  
917 documents on processing of human-readable Unicode text strings:
- 918 Unicode Character Encoding Model [UTR17] – multi-layer character model
- 919 Unicode Character Property Model [UTR23] – character properties
- 920 Unicode Conformance Model [UTR33] – Unicode conformance basis

## 921 **13. Security Considerations**

- 922 The IPP extensions defined in this specification require the same security considerations as  
923 defined in the Internet Printing Protocol/1.1 [STD92].
- 924 Implementations of this specification SHOULD conform to the following standard on  
925 processing of human-readable Unicode text strings, see:
- 926 Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks
- 927 Implementations of this specification are advised to also review the following informational  
928 document on processing of human-readable Unicode text strings:
- 929 Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

## 930 **14. IANA Considerations**

### 931 **14.1 Attribute Registrations**

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

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

- 935 The registry entries will contain the following information:

936	Document Description attributes:	Reference
937	-----	-----
938	document-name (name (MAX))	[PWG5100.5]

939		
940	Document Status attributes:	Reference
941	-----	-----
942	attributes-charset (charset)	[PWG5100.5]
943	attributes-natural-language (naturalLanguage)	[PWG5100.5]
944	compression(obsolete) (type2 keyword)	[PWG5100.5]
945	current-page-order (type2 keyword)	[PWG5100.5]
946	date-time-at-completed (dateTime)	[PWG5100.5]
947	date-time-at-created (dateTime)	[PWG5100.5]
948	date-time-at-processing (dateTime)	[PWG5100.5]
949	detailed-status-messages (1setOf text(MAX))	[PWG5100.5]
950	document-access-errors (1setOf text(MAX))	[PWG5100.5]
951	document-charset (charset)	[PWG5100.5]
952	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.5]
953	document-format (mimeMediaType)	[PWG5100.5]
954	document-format-details(obsolete) (1setOf collection)	[PWG5100.5]
955	document-format-details-detected(obsolete) (1setOf collection)	[PWG5100.5]
956		[PWG5100.5]
957	document-format-detected (mimeMediaType)	[PWG5100.5]
958	document-format-version(obsolete) (text(127))	[PWG5100.5]
959	document-format-version-detected(obsolete) (text(127))	[PWG5100.5]
960	document-job-id (integer(1:MAX))	[PWG5100.5]
961	document-job-uri (uri)	[PWG5100.5]
962	document-message (text(MAX))	[PWG5100.5]
963	document-natural-language (naturalLanguage)	[PWG5100.5]
964	document-number (integer(1:MAX))	[PWG5100.5]
965	document-printer-uri (uri)	[PWG5100.5]
966	document-state (type1 enum)	[PWG5100.5]
967	document-state-message (text(MAX))	[PWG5100.5]
968	document-state-reasons (1setOf type2 keyword)	[PWG5100.5]
969	document-uri (uri)	[PWG5100.5]
970	impressions (integer(0:MAX))	[PWG5100.5]
971	impressions-completed (integer(0:MAX))	[PWG5100.5]
972	impressions-completed-current-copy(obsolete) (integer(0:MAX))	[PWG5100.5]
973		[PWG5100.5]
974	k-octets (integer(0:MAX))	[PWG5100.5]
975	k-octets-processed (integer(0:MAX))	[PWG5100.5]
976	last-document (boolean)	[PWG5100.5]
977	media-sheets (integer(0:MAX))	[PWG5100.5]
978	media-sheets-completed (integer(0:MAX))	[PWG5100.5]
979	more-info (uri)	[PWG5100.5]
980	output-device-assigned (name(MAX))	[PWG5100.5]
981	printer-up-time (integer(1:MAX))	[PWG5100.5]
982	sheet-completed-copy-number(obsolete) (integer(0:MAX))	[PWG5100.5]
983	time-at-completed (integer(MIN:MAX))	[PWG5100.5]
984	time-at-creation (integer(MIN:MAX))	[PWG5100.5]
985	time-at-processing (integer(MIN:MAX))	[PWG5100.5]
986		
987	Document Template attributes:	Reference
988	-----	-----
989	copies (integer(1:MAX))	[PWG5100.5]
990	cover-back (collection)	[PWG5100.5]
991	<Member attributes are the same as the "cover-back" Job Template	
992	attribute>	[PWG5100.5]
993	cover-front (collection)	[PWG5100.5]

```

994     <Member attributes are the same as the "cover-front" Job Template
995     attribute> [PWG5100.5]
996     finishings (1setOf type2 enum) [PWG5100.5]
997     finishings-col (1setOf collection) [PWG5100.5]
998     <Member attributes are the same as the "finishings-col" Job Template
999     attribute> [PWG5100.5]
1000    force-front-side (1setOf integer(1:MAX)) [PWG5100.5]
1001    imposition-template (type2 keyword | name(MAX)) [PWG5100.5]
1002    media (type2 keyword | name(MAX)) [PWG5100.5]
1003    media-col (collection) [PWG5100.5]
1004    <Member attributes are the same as the "media-col" Job Template
1005    attribute> [PWG5100.5]
1006    media-input-tray-check (type2 keyword | name(MAX)) [PWG5100.5]
1007    number-up (integer(1:MAX)) [PWG5100.5]
1008    orientation-requested (type2 enum) [PWG5100.5]
1009    output-bin (type2 keyword | name(MAX)) [PWG5100.5]
1010    page-delivery (type2 keyword) [PWG5100.5]
1011    page-order-received (type2 keyword) [PWG5100.5]
1012    page-ranges (1setOf rangeOfInteger(1:MAX)) [PWG5100.5]
1013    presentation-direction-number-up (type2 keyword) [PWG5100.5]
1014    print-quality (type2 enum) [PWG5100.5]
1015    printer-resolution (resolution) [PWG5100.5]
1016    sides (type2 keyword) [PWG5100.5]
1017    x-image-position (type2 keyword) [PWG5100.5]
1018    x-image-shift (integer(MIN:MAX)) [PWG5100.5]
1019    x-sidel1-image-shift (integer(MIN:MAX)) [PWG5100.5]
1020    x-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1021    y-image-position (type2 keyword) [PWG5100.5]
1022    y-image-shift (integer(MIN:MAX)) [PWG5100.5]
1023    y-sidel1-image-shift (integer(MIN:MAX)) [PWG5100.5]
1024    y-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1025
1026    Operation attributes: Reference
1027    -----
1028    document-charset (charset) [PWG5100.5]
1029    document-number (integer(1:MAX)) [PWG5100.5]
1030
1031    Printer Description attributes: Reference
1032    -----
1033    document-creation-attributes-supported (1setOf type2 keyword)
1034    [PWG5100.5]

```

## 1035 14.2 Attribute Value Registrations

1036 The attribute values defined in this specification will be published by IANA according to the  
 1037 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1038 <http://www.iana.org/assignments/ipp-registrations>

1039 The registry entries will contain the following information:

1040	Attributes (attribute syntax)	
1041	Keyword Attribute Value	Reference



1042	-----	-----
1043	requested-attributes (1setOf type2 keyword)	[STD92]
1044	document-description	[PWG5100.5]
1045	document-template	[PWG5100.5]

### 1046 14.3 Type2 enum Registrations

1047 The enum values defined in this specification will be published by IANA according to the  
1048 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1049 <http://www.iana.org/assignments/ipp-registrations>

1050 The registry entries will contain the following information:

1051	Attributes (attribute syntax)		
1052	Enum Value	Enum Symbolic Name	Reference
1053	-----	-----	-----
1054	operations-supported (1setOf type2 enum)		[STD92]
1055	0x0033	Cancel-Document	[PWG5100.5]
1056	0x0034	Get-Document-Attributes	{PWG5100.5}
1057	0x0035	Get-Documents	[PWG5100.5]
1058	0x0036	Delete-Document (obsolete)	[PWG5100.5]
1059	0x0037	Set-Document-Attributes	[PWG5100.5]
1060			

### 1061 14.4 Operation Registrations

1062 The operations defined in this specification will be published by IANA according to the  
1063 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1064 <http://www.iana.org/assignments/ipp-registrations>

1065 The registry entries will contain the following information:

1066	Operation Name	Reference
1067	-----	-----
1068	Cancel-Document	[PWG5100.5]
1069	Cancel-Job (extension)	[PWG5100.5]
1070	Delete-Document (obsolete)	[PWG5100.5]
1071	Get-Document-Attributes	[PWG5100.5]
1072	Get-Documents	[PWG5100.5]
1073	Hold-Job (extension)	[PWG5100.5]
1074	Print-Job (extension)	[PWG5100.5]
1075	Print-URI (extension)	[PWG5100.5]
1076	Release-Job (extension)	[PWG5100.5]
1077	Send-Document (extension)	[PWG5100.5]
1078	Send-URI (extension)	[PWG5100.5]
1079	Set-Document-Attributes	[PWG5100.5]

## 1080 14.5 Attribute Group Registrations

1081 The attribute groups defined in this specification will be published by IANA according to the  
1082 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1083 <http://www.iana.org/assignments/ipp-registrations>

1084 The registry entries will contain the following information:

1085	Value	Attribute Group Name	Reference
1086	-----	-----	-----
1087	0x09	document-attributes-tag	[PWG5100.5]

## 1088 15. Overview of Changes

### 1089 15.1 IPP Document Object v1.1

1090 The following changes were made to the previous version of this specification [PWG5100.5-  
1091 2003]:

- 1092 • Printers no longer need to support multiple Document Jobs;
- 1093 • Rationale and model sections have been added;
- 1094 • References now point to the current versions of dependent documents and  
1095 specifications at the time of publication;
- 1096 • The "document-charset" operation attribute has been added to this specification;
- 1097 • The Delete-Document operation has been made obsolete;
- 1098 • Additional semantics for the deprecated Reprocess-Job and Restart-Job operations  
1099 have been removed;
- 1100 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no  
1101 longer (incorrectly) promoted to persistent Job and Document attributes;
- 1102 • The "compression" Document Status attribute has been made obsolete because it  
1103 serves no purpose;
- 1104 • Several "document-format-xxx" Document Status attributes have been made  
1105 obsolete because they have serious interoperability issues; and

- 1106       • The "impressions-completed-current-copy" and "sheet-completed-copy-number"  
1107       Document Status attributes have been made obsolete because the parent  
1108       specification (RFC 3381) is obsolete.

## 1109   **16. References**

### 1110   **16.1 Normative References**

- 1111   [BCP14]       S. Bradner, "Key words for use in RFCs to Indicate Requirement  
1112       Levels", RFC 2119/BCP 14, March 1997,  
1113       <https://tools.ietf.org/html/bcp14>
- 1114   [ISO10646]     "Information technology -- Universal Coded Character Set (UCS)",  
1115       ISO/IEC 10646:2011
- 1116   [PWG5100.1]    S. Kennedy, M. Sweet, "IPP Finishings 2.1", PWG 5100.1-2017,  
1117       February 2017, [https://ftp.pwg.org/pub/pwg/candidates/cs-  
1118       ippfinishings21-20170217-5100.1.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings21-20170217-5100.1.pdf)
- 1119   [PWG5100.2]    T. Hastings, R. Bergman, "Internet Printing Protocol (IPP): 'output-bin'  
1120       attribute extension", PWG 5100.2-2001, February 2001,  
1121       [https://ftp.pwg.org/pub/pwg/candidates/cs-ippoutputbin10-20010207-  
1122       5100.2.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippoutputbin10-20010207-5100.2.pdf)
- 1123   [PWG5100.3]    K. Ocke, T. Hastings, "Internet Printing Protocol (IPP): Production  
1124       Printing Attributes - Set 1", PWG 5100.3-2001, February 2001,  
1125       [https://ftp.pwg.org/pub/pwg/candidates/cs-ippprodprint10-20010212-  
1126       5100.3.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippprodprint10-20010212-5100.3.pdf)
- 1127   [PWG5100.11]   T. Hastings, "Internet Printing Protocol (IPP): Job and Printer  
1128       Extensions - Set 2 (JPS2)", PWG 5100.11-2010, October 2010,  
1129       [https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext10-  
1130       20101030-5100.11.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext10-20101030-5100.11.pdf)
- 1131   [RFC3380]       T. Hastings, R. Herriot, C. Kugler, H. Lewis, "Internet Printing Protocol  
1132       (IPP): Job and Printer Set Operations", RFC 3380, September 2002,  
1133       <https://tools.ietf.org/html/rfc3380>
- 1134   [RFC3998]       C. Kugler, H. Lewis, T. Hastings, "Internet Printing Protocol (IPP): Job  
1135       and Printer Administrative Operations", RFC 3998, March 2005,  
1136       <https://tools.ietf.org/html/rfc3998>
- 1137   [RFC5198]       J. Klensin, M. Padlipsky, "Unicode Format for Network Interchange",  
1138       RFC 5198, March 2008, <https://tools.ietf.org/html/rfc5198>

- 1139 [RFC7230] R. Fielding, J. Reschke, "Hypertext Transfer Protocol (HTTP/1.1):  
1140 Message Syntax and Routing", RFC 7230, June 2014,  
1141 <https://tools.ietf.org/html/rfc7230>
- 1142 [STD63] F. Yergeau, "UTF-8, a transformation format of ISO 10646", RFC  
1143 3629/STD 63, November 2003, <https://tools.ietf.org/html/std63>
- 1144 [STD92] M. Sweet, I. McDonald, "Internet Printing Protocol/1.1", STD 92, June  
1145 2018, <https://tools.ietf.org/html/std92>
- 1146 [UAX9] Unicode Consortium, "Unicode Bidirectional Algorithm", UAX#9, May  
1147 2018, <https://www.unicode.org/reports/tr9>
- 1148 [UAX14] Unicode Consortium, "Unicode Line Breaking Algorithm", UAX#14,  
1149 May 2018, <https://www.unicode.org/reports/tr14>
- 1150 [UAX15] M. Davis, M. Duerst, "Unicode Normalization Forms", Unicode  
1151 Standard Annex 15, May 2018, <https://www.unicode.org/reports/tr15>
- 1152 [UAX29] Unicode Consortium, "Unicode Text Segmentation", UAX#29, May  
1153 2018, <https://www.unicode.org/reports/tr29>
- 1154 [UAX31] Unicode Consortium, "Unicode Identifier and Pattern Syntax",  
1155 UAX#31, June 2018, <https://www.unicode.org/reports/tr31>
- 1156 [UNICODE] Unicode Consortium, "Unicode Standard", Version 11.0.0, June 2018,  
1157 <https://www.unicode.org/versions/Unicode11.0.0/>
- 1158 [UTS10] Unicode Consortium, "Unicode Collation Algorithm", UTS#10, May  
1159 2018, <https://www.unicode.org/reports/tr10>
- 1160 [UTS35] Unicode Consortium, "Unicode Locale Data Markup Language",  
1161 UTS#35, March 2018, <https://www.unicode.org/reports/tr35>
- 1162 [UTS39] Unicode Consortium, "Unicode Security Mechanisms", UTS#39, May  
1163 2018, <https://www.unicode.org/reports/tr39>

## 1164 **16.2 Informative References**

- 1165 [PWG5100.5-2003] D. Carney, T. Hastings, P. Zehler, "Standard for The Internet Printing  
1166 Protocol (IPP): Document Object", PWG 5100.5-2003 (obsoleted by  
1167 this specification), October 2003,  
1168 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject10-20031031-  
1169 5100.5.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject10-20031031-5100.5.pdf)

- 1170 [PWG5100.7-2003] T. Hastings, P. Zehler, "Standard for The Internet Printing Protocol  
1171 (IPP): Job Extensions", PWG 5100.7-2003, October 2003,  
1172 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext10-20031031-  
1173 5100.7.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext10-20031031-5100.7.pdf)
- 1174 [RFC3381-OBSOLETE]  
1175 T. Hastings, H. Lewis, R. Bergman, "Internet Printing Protocol (IPP):  
1176 Job Progress Attributes", RFC 3381 (obsoleted by RFC 8011),  
1177 September 2002, <https://tools.ietf.org/html/rfc3381>
- 1178 [UTR17] Unicode Consortium "Unicode Character Encoding Model", UTR#17,  
1179 November 2008, <https://www.unicode.org/reports/tr17>
- 1180 [UTR23] Unicode Consortium "Unicode Character Property Model", UTR#23,  
1181 May 2015, <https://www.unicode.org/reports/tr23>
- 1182 [UTR33] Unicode Consortium "Unicode Conformance Model", UTR#33,  
1183 November 2008, <https://www.unicode.org/reports/tr33>
- 1184 [UNISECFAQ] Unicode Consortium "Unicode Security FAQ", November 2013,  
1185 <https://www.unicode.org/faq/security.html>

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1196 To subscribe, see the PWG web page:

1197 <http://www.pwg.org/>

1198 Implementers of this specification are encouraged to join the IPP Mailing List in order to  
1199 participate in any discussions of clarification issues and review of registration proposals for  
1200 additional attributes and values.

1201 The editors would like to especially thank the following individuals who also contributed  
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1203 Dennis Carney (author of v1.0)  
1204 Tom Hastings (author of v1.0)  
1205 Ira McDonald (High North, Inc.)  
1206 Peter Zehler (author of v1.0)

## 1207 **18. Change History**

### 1208 **18.1 October 22, 2018**

- 1209 • Status: Interim.
- 1210 • Section 4: Changed to use "This specification" instead of "This document".
- 1211 • Figure 1: Updated with the list of operations.
- 1212 • Table 1: Added target object.
- 1213 • Editorial changes throughout.
- 1214 • Updated wording of the access rights section, per WG review comments on October  
1215 11, 2018
- 1216 • Table 9: Changed "Reference" column title to "Origin"
- 1217 • Updated references to the old PWG 5100.5 and 5100.7 to include the year, note they  
1218 are obsolete.
- 1219 • Updated RFC 3381 to note it is obsolete, obsoleted by RFC 8011
- 1220 •

### 1221 **18.2 September 19, 2018**

- 1222 • Initial revision for v1.1.
- 1223 • Updated to use new working draft template, section organizations.
- 1224 • Updated references.
- 1225 • Added Changes section.

- 1226 • Added proper rationale and model sections.
- 1227 • Printers no longer need to support multiple Document Jobs.
- 1228 • Added the "document-charset" operation attribute from PWG 5100.7.
- 1229 • Made the Delete-Document operation obsolete.
- 1230 • Made the "compression" Document Status attribute obsolete because it serves no  
1231 purpose.
- 1232 • Made several "document-format-xxx" Document Status attributes from PWG 5100.7  
1233 obsolete because they have serious interoperability issues.
- 1234 • Made the "impressions-completed-current-copy" and "sheet-completed-copy-  
1235 number" Document Status attributes obsolete because the parent specification (RFC  
1236 3381) is obsolete.