



The Printer Working Group

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Working Draft

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## IPP Document Object v1.1 (DOCOBJECT)

Status: Stable

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:

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71 For additional information regarding the Printer Working Group visit:

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## 179 **1. Introduction**

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

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

## 186 **2. Terminology**

### 187 **2.1 Conformance Terminology**

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

193 The term DEPRECATED is used for previously defined and approved protocol elements that  
194 SHOULD NOT be used or implemented. The term OBSOLETE is used for previously defined  
195 and approved protocol elements that MUST NOT be used or implemented.

### 196 **2.2 Printing Terminology**

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

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

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

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

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

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

## 209 **2.3 Protocol Role Terminology**

210 This specification also defines the following protocol roles to specify unambiguous  
211 conformance requirements:

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

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

## 217 **2.4 Other Terminology**

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

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

224 *Document Level*: Operation and Document Template attributes supplied in the Send-  
225 Document and Send-URI operations are referred to as being supplied at the Document  
226 Level. Attributes supplied in the Print-Job and Print-URI operations are considered as being  
227 supplied at the Job Level only, *not* also at the Document Level, even though Print-Job and  
228 Print-URI also create Document objects.

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

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

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

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

## 237 **2.5 Acronyms and Organizations**

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

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



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

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

## 242 **3. Requirements**

### 243 **3.1 Rationale**

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

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

251 Rationale for the changes from the previous versions of this specification can be found in  
252 section 15.

### 253 **3.2 Use Cases**

#### 254 **3.2.1 Specify Per-Document Print Intent**

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

#### 260 **3.2.2 See a List of Documents in a Job**

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

#### 264 **3.2.3 Cancel a Single Document**

265 Bob has submitted a multi-document job to a printer but realizes there was a typographical  
266 error in one of the documents that has not yet printed. He uses an application on his  
267 computer to view the list of jobs on the printer, views the list of documents in the job he  
268 submitted, and initiates a cancel action for the document containing the error.

### 269 **3.3 Exceptions**

270 There are no exceptions defined for this specification.

### 271 **3.4 Out of Scope**

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

- 273 1. Definition of copy or page level semantics; and
- 274 2. Definition of per-page or per-copy overrides.

### 275 **3.5 Design Requirements**

276 The design requirements for this specification are:

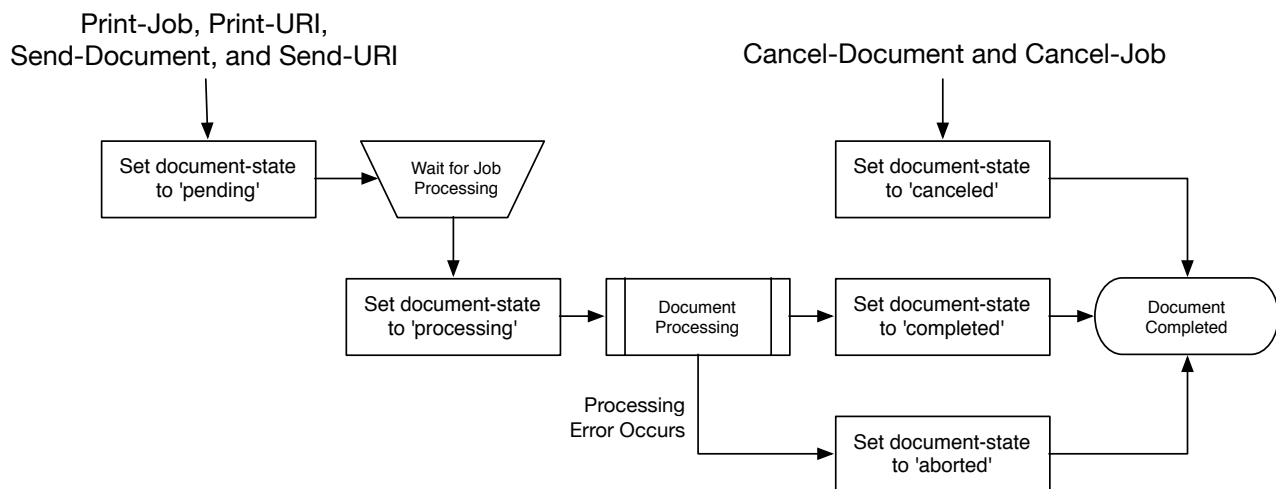
- 277 1. Define an abstract IPP Document object and its semantics;
- 278 2. Define an attribute group tag for attributes of an IPP Document object;
- 279 3. Define attributes and values to describe an IPP Document object;
- 280 4. Define operations for querying and manipulating IPP Document objects;
- 281 5. Extend existing operations to explicitly create IPP Document objects;
- 282 6. Define security requirements necessary to support IPP Document objects; and
- 283 7. Define sections to register all objects, attribute groups, attributes, values, and
- 284 operations with IANA.
- 285

## 286 4. Model

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

### 291 4.1 Document Object

292 The Document object represents a single Document in a Job that contains Document-  
 293 specific Description, Status, and Template attributes. Document Description attributes  
 294 provide information about the Document, Document Status attributes provide state  
 295 information for the Document, and Document Template attributes override the  
 296 corresponding Job Template attributes for the Document. A Document object also contains  
 297 the Document data and/or a URI that references the Document data. Figure 1 shows the life  
 298 cycle of the Document object.



299

300

Figure 1 - Document Object Life Cycle

## 301 4.2 Operations

302 The Print-Job and Print-URI operations [STD92] create a Job object containing a single  
 303 Document object while the Create-Job operation [STD92] creates a Job object with no  
 304 Document objects. The Send-Document and Send-URI operations [STD92] add Document  
 305 objects to the specified Job object. Printers conforming to this specification MUST support  
 306 the Create-Job and Send-Document operations.

307 This specification extends the Send-Document and Send-URI operations to accept  
 308 Document Template attributes in the Document Attributes group. The Document Template  
 309 attributes are applied to the Document object being created, overriding any corresponding

310 Job Template attributes supplied at the Job Level which allows the Client to vary the  
 311 Document Template attributes between Document objects in a single Job.

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

314 **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

### 315 **4.3 Job and Document Template Attributes**

316 Clients **OPTIONALLY** supply Job Template attributes in Create-Job, Print-Job, and Print-  
 317 URI requests, and **OPTIONALLY** supply Document Template attributes in Print-Job, Print-  
 318 URI, Send-Document, and Send-URI requests. Job Template attributes apply to the Job as  
 319 a whole. Document Template attributes apply only to the corresponding Document object.

320 Printers **MUST** support the following Attribute Precedence from highest to lowest when  
 321 processing a Document:

- 322 1. Document Level - The Document Template attributes supplied in the Document  
 323 Creation request or a subsequent Set-Document-Attributes request;
- 324 2. Job Level - The Job Template attributes supplied in the Job Creation request or  
 325 a subsequent Set-Job-Attributes request; and
- 326 3. Printer Default - The Printer Default attributes as supplied by the manufacturer  
 327 or configured by the operator or administrator using a Set-Printer-Attributes  
 328 request.

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

## 332 **5. New Operations**

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

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

## 337 **5.1 Document Operations**

### 338 **5.1.1 Cancel-Document**

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

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

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

353 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can  
354 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-  
355 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as  
356 appropriate.  
357

358

**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'

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

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

### 366 5.1.1.1 Cancel-Document Request

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

368 Group 1: Operation Attributes

369 Natural Language and Character Set:

370 The "attributes-charset" and "attributes-natural-language" attributes as  
 371 described in [STD92].

372 Target:

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

379 Requesting User Name:

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

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

383 The Client MAY supply this attribute. If supported by the Printer, the Printer  
384 MUST also support the corresponding "document-message" (text(MAX))  
385 Document Status attribute (see section 6.2.3) and copy the value to the  
386 Document's "document-message" attribute.

### 387 **5.1.1.2 Cancel-Document Response**

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

389 Group 1: Operation Attributes

390 Status Message:

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

395 Natural Language and Character Set:

396 The "attributes-charset" and "attributes-natural-language" attributes as  
397 described in [STD92].

398 Group 2: Unsupported Attributes

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

### 400 **5.1.2 Get-Document-Attributes**

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

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

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

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

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

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

418 Printers MUST support all group names and MUST return all supported attributes belonging  
419 to the group.

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

#### 424 **5.1.2.1 Get-Document-Attributes Request**

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

426 Group 1: Operation Attributes

427 Natural Language and Character Set:

428 The "attributes-charset" and "attributes-natural-language" attributes as  
429 described in [STD92].

430 Target:

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

437 Requesting User Name:

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

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

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



### 446 5.1.2.2 Get-Document-Attributes Response

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

448 Group 1: Operation Attributes

449 Status Message:

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

454 Natural Language and Character Set:

455 The "attributes-charset" and "attributes-natural-language" attributes as  
456 described in [STD92]. The "attributes-natural-language" MAY be the natural  
457 language of the Document object rather than the one in the Get-Document-  
458 Attributes request.

459 Group 2: Unsupported Attributes

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

461 The response MAY contain the "requested-attributes" operation attribute with  
462 any supplied values (attribute keywords) that were requested by the Client  
463 but are not supported by the Printer. If the Printer does return unsupported  
464 attributes referenced in the "requested-attributes" operation attribute and that  
465 attribute included group names such as 'all', the unsupported attributes  
466 MUST NOT include attributes described in the standard but not supported by  
467 the implementation.

468 Group 3: Document Attributes

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

### 479 5.1.3 Set-Document-Attributes

480 This OPTIONAL Document operation allows a Client to set the values of the attributes of a  
 481 Document object after the Document object is submitted to the Printer. In the request, the  
 482 Client supplies the set of Document attributes and values that are to be set. In the response,  
 483 the Printer returns success or rejects the entire request with indications of which attribute or  
 484 attributes could not be set.

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

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

494 The Printer MUST accept or reject this operation when the Document's "document-state"  
 495 attribute has the values shown in Table 3 but MUST NOT change the state of the Document  
 496 object since the Document is a passive object and the Document state is a subset of the Job  
 497 State. For example, in the case where the operation creates a request for unavailable  
 498 resources, the Job (but not the Document) transitions to a new state.

499 **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'

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

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

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

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

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

### 522 **5.1.3.1 Set-Document-Attributes Request**

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

524 Group 1: Operation Attributes

525 Natural Language and Character Set:

526 The "attributes-charset" and "attributes-natural-language" attributes as  
527 described in [STD92].

528 Target:

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

535 Requesting User Name:

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

538 Group 2: Document Attributes

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

### 544 **5.1.3.2 Set-Document-Attributes Response**

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

547 Group 1: Operation Attributes

548 Status Message:

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

553 Natural Language and Character Set:

554 The "attributes-charset" and "attributes-natural-language" attributes as  
555 described in [STD92].

556 Group 2: Unsupported Attributes

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

558 If some of the attributes in the operation fail to validate, the Printer MUST  
559 reject the operation, MUST NOT change any Document attributes, and  
560 MUST return the indicated status code below. In this group, the Printer  
561 MUST also return all attributes that fail to validate. The following are the  
562 reasons that an attribute fails to validate and the value returned for the  
563 attribute, along with the indicated status code and order of detection:

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

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

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

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

## 587 **5.2 Job Operations**

### 588 **5.2.1 Get-Documents**

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

593 This operation is similar to the Get-Document-Attributes operation (see section 5.1.2),  
594 except that this operation returns attributes from all Document objects contained in the Job  
595 object instead of from a single selected Document object in the Job object. As with the Get-  
596 Document-Attributes operation, the Printer MUST only return attributes that were submitted  
597 by a Client or generated by the Printer.

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

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

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

### 607 **5.2.1.1 Get-Documents Request**

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

609 Group 1: Operation Attributes

610 Natural Language and Character Set:

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

612 Target:

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

616 Requesting User Name:

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

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

620 The client OPTIONALLY supplies and the Printer MUST support this  
621 operation attribute, which determines the maximum number of Documents  
622 that a Client will receive from the Printer. The limit is a "stateless limit" in that  
623 if the value supplied by the Client is 'N', then only the first 'N' Documents are  
624 returned in the Get-Documents Response. There is no mechanism to allow  
625 for the next 'M' Documents after the first 'N' Documents. If the Client does not  
626 supply the "limit" attribute, the Printer responds with all Documents in the  
627 Job.

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

629 The client OPTIONALLY supplies and the Printer MUST support this  
630 attribute, which is a list of Document attribute names and/or attribute group  
631 names that are returned to the Client for each Document object. The allowed  
632 attribute group names are the same as those defined in the Get-Documents-  
633 Attributes operation in section 5.1.2. If the Client does not supply this  
634 attribute, the Printer MUST respond as if the Client had supplied this attribute  
635 with the single value 'document-number'.

### 636 **5.2.1.2 Get-Documents Response**

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

638 Group 1: Operation Attributes

639 Status Message:

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

644 Natural Language and Character Set:

645 The "attributes-charset" and "attributes-natural-language" attributes as  
646 described in [STD92].

647 Group 2: Unsupported Attributes

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

649 The response MAY contain the "requested-attributes" operation attribute with  
650 any supplied values (attribute keywords) that were requested by the Client  
651 but are not supported by the Printer. If the Printer does return unsupported  
652 attributes referenced in the "requested-attributes" operation attribute and that  
653 attribute included group names such as 'all', the unsupported attributes  
654 MUST NOT include attributes described in the standard but not supported by  
655 the implementation.

656 Groups 3 to N: Document Attributes

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

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

669 **6. New Attributes**670 **6.1 Document Description Attributes**671 **6.1.1 document-name (name(MAX))**

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

675 **6.2 Document Status Attributes**

676 Table 4 lists the Document Status attributes defined by this specification. Printers that  
 677 support a given operation or Job Status attribute MUST support the corresponding  
 678 Document Status attribute.

679 **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-job-uri (uri)	job-uri	[STD92]



Document Attribute	Operation/Job Attribute	Reference
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]

680 Note 1: The "document-state" attribute supports all of the "job-state" values *except*  
681 '4' (pending-held).

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

**685 6.2.1 document-charset (charset)**

686 This RECOMMENDED Document Status attribute specifies the charset used in the  
 687 Document data. The Printer sets this attribute from the corresponding operation attribute  
 688 supplied by the Client in the Document Creation request. Printers that support the  
 689 "document-charset" operation attribute MUST support this attribute.

**690 6.2.2 document-format-detected (mimeMediaType)**

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

**693 6.2.3 document-message (text(MAX))**

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

**700 6.2.4 document-number (integer(1:MAX))**

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

**704 6.2.5 last-document (boolean)**

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

**710 6.3 Document Template Attributes**

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

**713 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]

## 714 6.4 Operation Attributes

### 715 6.4.1 document-charset (charset)

716 This RECOMMENDED operation attribute specifies the character set used by the Document  
717 data.

### 718 6.4.2 document-number (integer(1:MAX))

719 This REQUIRED operation attribute specifies the ordinal number of the Document within the  
720 Job.

## 721 **6.5 Printer Description Attributes**

### 722 **6.5.1 document-creation-attributes-supported (1setOf type2 keyword)**

723 This REQUIRED attribute lists the keyword names of the Document Template and operation  
724 attributes that the Printer will accept in the Send-Document and Send-URI Document  
725 Creation operations. Implementations that support the Send-URI operation MUST include  
726 the ‘document-uri’ keyword in “document-creation-attributes-supported”. Implementations  
727 that do not support Send-URI MUST NOT include the ‘document-uri’ keyword in “document-  
728 creation-attributes-supported”.

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

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

### 733 **7.1 document-attributes-tag**

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

736

## 737 **8. Additional Semantics for Existing Operations**

### 738 **8.1 Cancel-Job: "document-state" and "document-state-reasons"**

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

### 743 **8.2 Hold-Job and Release-Job: "document-state-reasons"**

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

### 747 **8.3 Print-Job, Print-URI: Document Object and Attributes**

748 This specification extends the REQUIRED Print-Job and OPTIONAL Print-URI operations  
749 [STD92] to explicitly create a Document object and copy the request operation attributes  
750 listed in Table 6 to the corresponding Document attributes. Printers MUST NOT copy Job  
751 Template attributes to the created Document object.  
752 Printers can also return the attributes listed in

753 Table 7 in the Document attributes group after the Job attributes group.

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

<b>Operation Attribute</b>	<b>Document Attribute</b>	<b>Reference</b>
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
job-k-octets	k-octets	[STD92], Section 6.2
job-media-sheets	media-sheets	[STD92], Section 6.2

755

756

**Table 7 - Returned Document Status Attributes**

<b>Document Status Attribute</b>	<b>Print-xxx Conformance</b>	<b>Send-xxx Conformance</b>	<b>Reference</b>
document-number	OPTIONAL	REQUIRED	Section 6.2.4
document-state	OPTIONAL	REQUIRED	Section 6.2
document-state-message	OPTIONAL	OPTIONAL	Section 6.2
document-state-reasons	OPTIONAL	REQUIRED	Section 6.2

757 **8.3.1 Print-Job/Print-URI Response**

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

759 Group 1: Operation Attributes

760 As specified in [STD92].

761 Group 2: Unsupported Attributes

762 As specified in [STD92].

763 Group 3: Job Object Attributes

764 As specified in [STD92].

765 Group 4: Document Object Attributes (new)

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

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

769 "document-state" (type1 enum):

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

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

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

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

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

**776 8.4 Send-Document: Document Object and Attributes**

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

780 The Send-Document request is also extended to support an additional Document Template  
781 attribute group after the operation attribute group. Document Template attributes are copied  
782 to the Document object after validation as described in section 4.3. Printers MUST NOT  
783 copy Document Template attributes to the Job object.  
784 Finally, Printers also return the attributes listed in



785 Table 7 in the Document attributes group after the Job attributes group.

#### 786 **8.4.1 Send-Document Request**

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

788 Group 1: Operation Attributes

789 As specified in [STD92].

790 Group 2: Document Template Attributes (new)

791 The Client OPTIONALLY supplies and the Printer MUST support a set of  
792 Document Template attributes. If the Client is not supplying any Document  
793 Template attributes in the request, the Client SHOULD omit Group 2 rather  
794 than sending an empty group. However, a Printer MUST be able to accept  
795 an empty group.

796 Group 3: Document Data

797 As specified in [STD92].

#### 798 **8.4.2 Send-Document Response**

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

800 Group 1: Operation Attributes

801 As specified in [STD92].

802 Group 2: Unsupported Attributes

803 As specified in [STD92].

804 Group 3: Job Object Attributes

805 As specified in [STD92].

806 Group 4: Document Object Attributes (new)

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

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

810 "document-state" (type1 enum):

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

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

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

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

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

## 817 **8.5 Send-URI: Document Object and Attributes**

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

821 The Send-URI request is also extended to support an additional Document Template  
822 attribute group after the operation attribute group. Document Template attributes are copied  
823 to the Document object after validation as described in section 4.3. Printers MUST NOT  
824 copy Document Template attributes to the Job object.  
825 Finally, Printers also return the attributes listed in

826 Table 7 in the Document attributes group after the Job attributes group.

### 827 **8.5.1 Send-URI Request**

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

829 Group 1: Operation Attributes

830 As specified in [STD92].

831 Group 2: Document Template Attributes (new)

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

### 837 **8.5.2 Send-URI Response**

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

839 Group 1: Operation Attributes

840 As specified in [STD92].

841 Group 2: Unsupported Attributes

842 As specified in [STD92].

843 Group 3: Job Object Attributes

844 As specified in [STD92].

845 Group 4: Document Object Attributes (new)

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

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

849 "document-state" (type1 enum):

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

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

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

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

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

## 856 9. Additional Values for Existing Attributes

### 857 9.1 operations-supported (1setOf type2 enum)

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

859 **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

### 860 9.2 requested-attributes (1setOf type2 keyword)

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

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

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

865

## 866 10. Obsolete Operations and Attributes

### 867 10.1 Obsolete Delete-Document Operation

868 The OBSOLETE Delete-Document operation removes the specified Document object and  
 869 its data immediately from the specified Job. This operation is OBSOLETE because it  
 870 destroys accounting information about the target Document and MUST NOT be supported  
 871 by new implementations of this specification.

### 872 10.2 Obsolete Document Status Attributes

873 Table 9 lists the OBSOLETE Document Status attributes that were defined in the previous  
 874 version of this specification [PWG5100.5-2003].

875 Note: This specification does not change the status of the original operation or Job Status  
 876 attributes that have the same names.

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

Attribute	Origin
compression (type2 keyword)	[STD92]
document-digital-signature (type2 keyword)	[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]

## 878 11. Conformance Requirements

### 879 11.1 Printer Conformance Requirements

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

- 881 1. The required operations defined in section 5;
- 882 2. The required attributes and values defined in section 6;
- 883 3. The new attribute group tag defined in section 7;
- 884 4. The additional semantics defined in section 8;
- 885 5. The additional values defined in section 9;
- 886 6. The internationalization considerations defined in section 12; and
- 887 7. The security considerations defined in section 13.

## 888 11.2 Client Conformance Requirements

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

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

## 896 12. Internationalization Considerations

897 For interoperability and basic support for multiple languages, conforming implementations  
898 MUST support:

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

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

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

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

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

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

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

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

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

918 Unicode Collation Algorithm [UTS10] – sorting

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

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

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

923 Unicode Character Property Model [UTR23] – character properties

924 Unicode Conformance Model [UTR33] – Unicode conformance basis

## 925 **13. Security Considerations**

926 The IPP extensions defined in this specification require the same security considerations as  
927 defined in the Internet Printing Protocol/1.1 [STD92].

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

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

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

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

## 934 **14. IANA Considerations**

### 935 **14.1 Attribute Registrations**

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

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

939 The registry entries will contain the following information:

940	Document Description attributes:	Reference
941	-----	-----
942	document-name (name(MAX))	[PWG5100.5]
943		
944	Document Status attributes:	Reference
945	-----	-----
946	attributes-charset (charset)	[PWG5100.5]
947	attributes-natural-language (naturalLanguage)	[PWG5100.5]
948	compression(obsolete) (type2 keyword)	[PWG5100.5]

949	current-page-order (type2 keyword)	[PWG5100.5]
950	date-time-at-completed (dateTime)	[PWG5100.5]
951	date-time-at-created (dateTime)	[PWG5100.5]
952	date-time-at-processing (dateTime)	[PWG5100.5]
953	detailed-status-messages (1setOf text(MAX))	[PWG5100.5]
954	document-access-errors (1setOf text(MAX))	[PWG5100.5]
955	document-charset (charset)	[PWG5100.5]
956	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.5]
957	document-format (mimeMediaType)	[PWG5100.5]
958	document-format-detected (mimeMediaType)	[PWG5100.5]
959	document-format-version(obsolete) (text(127))	[PWG5100.5]
960	document-format-version-detected(obsolete) (text(127))	[PWG5100.5]
961	document-job-id (integer(1:MAX))	[PWG5100.5]
962	document-job-uri (uri)	[PWG5100.5]
963	document-message (text(MAX))	[PWG5100.5]
964	document-natural-language (naturalLanguage)	[PWG5100.5]
965	document-number (integer(1:MAX))	[PWG5100.5]
966	document-printer-uri (uri)	[PWG5100.5]
967	document-state (type1 enum)	[PWG5100.5]
968	document-state-message (text(MAX))	[PWG5100.5]
969	document-state-reasons (1setOf type2 keyword)	[PWG5100.5]
970	document-uri (uri)	[PWG5100.5]
971	impressions (integer(0:MAX))	[PWG5100.5]
972	impressions-completed (integer(0:MAX))	[PWG5100.5]
973	impressions-completed-current-copy(obsolete) (integer(0:MAX))	[PWG5100.5]
974		[PWG5100.5]
975	k-octets (integer(0:MAX))	[PWG5100.5]
976	k-octets-processed (integer(0:MAX))	[PWG5100.5]
977	last-document (boolean)	[PWG5100.5]
978	media-sheets (integer(0:MAX))	[PWG5100.5]
979	media-sheets-completed (integer(0:MAX))	[PWG5100.5]
980	more-info (uri)	[PWG5100.5]
981	output-device-assigned (name(MAX))	[PWG5100.5]
982	printer-up-time (integer(1:MAX))	[PWG5100.5]
983	sheet-completed-copy-number(obsolete) (integer(0:MAX))	[PWG5100.5]
984	time-at-completed (integer(MIN:MAX))	[PWG5100.5]
985	time-at-creation (integer(MIN:MAX))	[PWG5100.5]
986	time-at-processing (integer(MIN:MAX))	[PWG5100.5]
987		
988	Document Template attributes:	Reference
989	-----	-----
990	copies (integer(1:MAX))	[PWG5100.5]
991	cover-back (collection)	[PWG5100.5]
992	<Member attributes are the same as the "cover-back" Job Template	
993	attribute>	[PWG5100.5]
994	cover-front (collection)	[PWG5100.5]
995	<Member attributes are the same as the "cover-front" Job Template	
996	attribute>	[PWG5100.5]
997	finishings (1setOf type2 enum)	[PWG5100.5]
998	finishings-col (1setOf collection)	[PWG5100.5]
999	<Member attributes are the same as the "finishings-col" Job Template	
1000	attribute>	[PWG5100.5]
1001	force-front-side (1setOf integer(1:MAX))	[PWG5100.5]
1002	imposition-template (type2 keyword   name(MAX))	[PWG5100.5]
1003	media (type2 keyword   name(MAX))	[PWG5100.5]
1004	media-col (collection)	[PWG5100.5]



1005	<Member attributes are the same as the "media-col" Job Template	
1006	attribute>	[PWG5100.5]
1007	media-input-tray-check (type2 keyword   name(MAX))	[PWG5100.5]
1008	number-up (integer(1:MAX))	[PWG5100.5]
1009	orientation-requested (type2 enum)	[PWG5100.5]
1010	output-bin (type2 keyword   name(MAX))	[PWG5100.5]
1011	page-delivery (type2 keyword)	[PWG5100.5]
1012	page-order-received (type2 keyword)	[PWG5100.5]
1013	page-ranges (1setOf rangeOfInteger(1:MAX))	[PWG5100.5]
1014	presentation-direction-number-up (type2 keyword)	[PWG5100.5]
1015	print-quality (type2 enum)	[PWG5100.5]
1016	printer-resolution (resolution)	[PWG5100.5]
1017	sides (type2 keyword)	[PWG5100.5]
1018	x-image-position (type2 keyword)	[PWG5100.5]
1019	x-image-shift (integer(MIN:MAX))	[PWG5100.5]
1020	x-side1-image-shift (integer(MIN:MAX))	[PWG5100.5]
1021	x-side2-image-shift (integer(MIN:MAX))	[PWG5100.5]
1022	y-image-position (type2 keyword)	[PWG5100.5]
1023	y-image-shift (integer(MIN:MAX))	[PWG5100.5]
1024	y-side1-image-shift (integer(MIN:MAX))	[PWG5100.5]
1025	y-side2-image-shift (integer(MIN:MAX))	[PWG5100.5]
1026		
1027	Operation attributes:	Reference
1028	-----	-----
1029	document-charset (charset)	[PWG5100.5]
1030	document-number (integer(1:MAX))	[PWG5100.5]
1031		
1032	Printer Description attributes:	Reference
1033	-----	-----
1034	document-creation-attributes-supported (1setOf type2 keyword)	
1035		[PWG5100.5]

## 1036 14.2 Type2 keyword Registrations

1037 The keyword values defined in this specification will be published by IANA according to the  
 1038 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1039 <http://www.iana.org/assignments/ipp-registrations>

1040 The registry entries will contain the following information:

1041	Attributes (attribute syntax)	
1042	Keyword Attribute Value	Reference
1043	-----	-----
1044	requested-attributes (1setOf type2 keyword)	[STD92]
1045	document-description	[PWG5100.5]
1046	document-template	[PWG5100.5]

### 1047 14.3 Type2 enum Registrations

1048 The enum values defined in this specification will be published by IANA according to the  
1049 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1050 <http://www.iana.org/assignments/ipp-registrations>

1051 The registry entries will contain the following information:

1052	Attributes (attribute syntax)		
1053	Enum Value	Enum Symbolic Name	Reference
1054	-----	-----	-----
1055	operations-supported	(1setOf type2 enum)	[STD92]
1056	0x0033	Cancel-Document	[PWG5100.5]
1057	0x0034	Get-Document-Attributes	{PWG5100.5}
1058	0x0035	Get-Documents	[PWG5100.5]
1059	0x0036	Delete-Document (obsolete)	[PWG5100.5]
1060	0x0037	Set-Document-Attributes	[PWG5100.5]
1061			

### 1062 14.4 Operation Registrations

1063 The operations defined in this specification will be published by IANA according to the  
1064 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1065 <http://www.iana.org/assignments/ipp-registrations>

1066 The registry entries will contain the following information:

1067	Operation Name	Reference
1068	-----	-----
1069	Cancel-Document	[PWG5100.5]
1070	Cancel-Job (extension)	[PWG5100.5]
1071	Delete-Document (obsolete)	[PWG5100.5]
1072	Get-Document-Attributes	[PWG5100.5]
1073	Get-Documents	[PWG5100.5]
1074	Hold-Job (extension)	[PWG5100.5]
1075	Print-Job (extension)	[PWG5100.5]
1076	Print-URI (extension)	[PWG5100.5]
1077	Release-Job (extension)	[PWG5100.5]
1078	Send-Document (extension)	[PWG5100.5]
1079	Send-URI (extension)	[PWG5100.5]
1080	Set-Document-Attributes	[PWG5100.5]

### 1081 14.5 Attribute Group Registrations

1082 The attribute groups defined in this specification will be published by IANA according to the  
1083 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1084 <http://www.iana.org/assignments/ipp-registrations>

1085 The registry entries will contain the following information:

1086	Value	Attribute Group Name	Reference
1087	-----	-----	-----
1088	0x09	document-attributes-tag	[PWG5100.5]

## 1089 **15. Overview of Changes**

### 1090 **15.1 IPP Document Object v1.1**

1091 The following changes were made to the previous version of this specification [PWG5100.5-  
1092 2003]:

- 1093 • Printers no longer need to support multiple Document Jobs, as the Document object  
1094 and associated operations are useful even for single Document Jobs;
- 1095 • Rationale and model sections have been added;
- 1096 • References now point to the current versions of dependent documents and  
1097 specifications at the time of publication;
- 1098 • The "document-charset" operation attribute has been added to this specification;
- 1099 • The Delete-Document operation has been made OBSOLETE because it destroys  
1100 accounting information;
- 1101 • Additional semantics for the DEPRECATED Reprocess-Job and Restart-Job  
1102 operations have been removed because those operations SHOULD NOT be  
1103 implemented or used;
- 1104 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no  
1105 longer promoted to persistent Job and Document attributes because they are only  
1106 utilized during Job Creation;
- 1107 • The "compression" Document Status attribute has been made OBSOLETE because  
1108 it serves no purpose;
- 1109 • The "document-digital-signature" Document Status attribute has been made  
1110 OBSOLETE because it serves no purpose;
- 1111 • The "document-format-details" and "document-format-details-detected" Document  
1112 Status attributes have been moved to the IPP Job Extensions v2.0 specification;

- 1113 • The "document-format-version" and "document-format-version-detected" Document  
1114 Status attributes have been made OBSOLETE because they have serious  
1115 interoperability issues; and
- 1116 • The "impressions-completed-current-copy" and "sheet-completed-copy-number"  
1117 Document Status attributes have been made OBSOLETE because the parent  
1118 specification (RFC 3381) is OBSOLETE.

## 1119 16. References

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1196

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1206 [ipp@pwg.org](mailto:ipp@pwg.org) (subscribers only)

1207 To subscribe, see the PWG web page:

1208 <http://www.pwg.org/>

1209 Implementers of this specification are encouraged to join the IPP Mailing List in order to  
1210 participate in any discussions of clarification issues and review of registration proposals for  
1211 additional attributes and values.

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1217 Peter Zehler (author of v1.0)

1218

## 1219 **18. Change History**

### 1220 **18.1 April 18, 2019**

- 1221 • Removed document-format-details-xxx from obsolete attributes (moved to JOBEXT)
- 1222 • Various editorial corrections

### 1223 **18.2 March 18, 2019**

- 1224 • Stable: Stable
- 1225 • Section 2.1: Added definitions of DEPRECATED and OBSOLETE
- 1226 • Section 3.1: Added forward reference to section 15
- 1227 • Section 15: Updated with rationale
- 1228 • Global: "obsolete" and "deprecated" are now "OBSOLETE" and "DEPRECATED"

### 1229 **18.3 January 29, 2019**

- 1230 • Status: Prototype
- 1231 • Fixed broken references throughout
- 1232 • Section 10.2: Say "operation and Job Status" instead of "non-document"

### 1233 **18.4 October 22, 2018**

- 1234 • Status: Interim.
- 1235 • Section 4: Changed to use "This specification" instead of "This document".
- 1236 • Figure 1: Updated with the list of operations.
- 1237 • Table 1: Added target object.
- 1238 • Editorial changes throughout.
- 1239 • Updated wording of the access rights section, per WG review comments on October  
1240 11, 2018



- 1241 • Table 9: Changed "Reference" column title to "Origin"
- 1242 • Updated references to the old PWG 5100.5 and 5100.7 to include the year, note they  
1243 are obsolete.
- 1244 • Updated RFC 3381 to note it is obsolete, obsoleted by RFC 8011
- 1245 **18.5 September 19, 2018**
- 1246 • Initial revision for v1.1.
- 1247 • Updated to use new working draft template, section organizations.
- 1248 • Updated references.
- 1249 • Added Changes section.
- 1250 • Added proper rationale and model sections.
- 1251 • Printers no longer need to support multiple Document Jobs.
- 1252 • Added the "document-charset" operation attribute from PWG 5100.7.
- 1253 • Made the Delete-Document operation obsolete.
- 1254 • Made the "compression" Document Status attribute obsolete because it serves no  
1255 purpose.
- 1256 • Made several "document-format-xxx" Document Status attributes from PWG 5100.7  
1257 obsolete because they have serious interoperability issues.
- 1258 • Made the "impressions-completed-current-copy" and "sheet-completed-copy-  
1259 number" Document Status attributes obsolete because the parent specification (RFC  
1260 3381) is obsolete.