



The Printer Working Group

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Working Draft

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IPP Document Object v1.1 (DOCOBJECT)

Status: Prototype

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

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

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177 **1. Introduction**

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

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

184 **2. Terminology**

185 **2.1 Conformance Terminology**

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

191 **2.2 Printing Terminology**

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

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

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

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

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

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

204 **2.3 Protocol Role Terminology**

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

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

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

212 **2.4 Other Terminology**

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

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

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

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

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

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

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

232 **2.5 Acronyms and Organizations**

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

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

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

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

237 **3. Requirements**

238 **3.1 Rationale**

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

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

246 **3.2 Use Cases**

247 **3.2.1 Specify Per-Document Print Intent**

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

253 **3.2.2 See a List of Documents in a Job**

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

257 **3.2.3 Cancel a Single Document**

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

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

262 **3.3 Exceptions**

263 There are no exceptions defined for this specification.

264 **3.4 Out of Scope**

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

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

268 **3.5 Design Requirements**

269 The design requirements for this specification are:

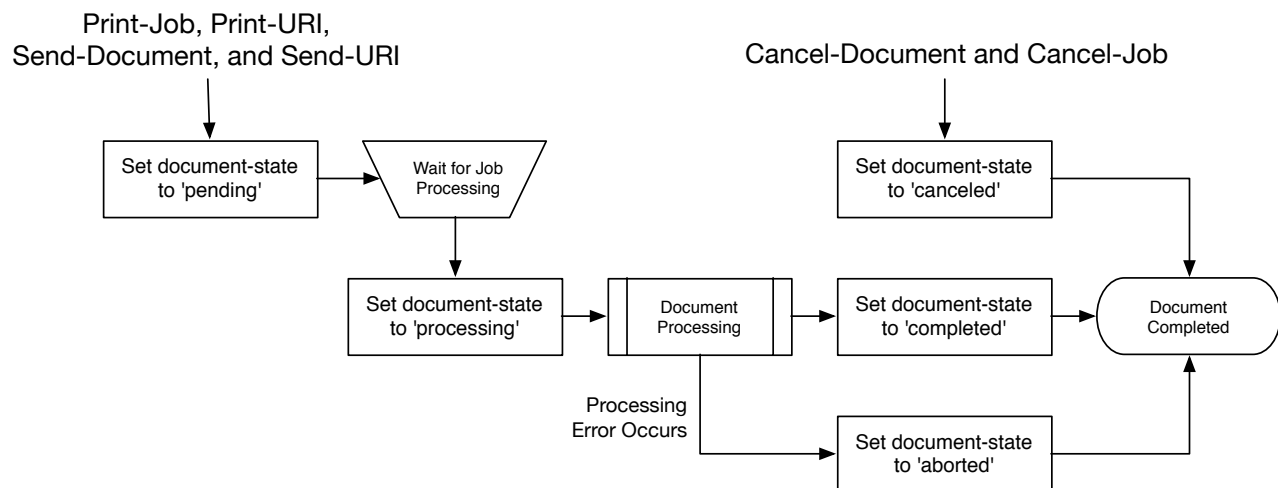
- 270 1. Define an abstract IPP Document object and its semantics;
- 271 2. Define an attribute group tag for attributes of an IPP Document object;
- 272 3. Define attributes and values to describe an IPP Document object;
- 273 4. Define operations for querying and manipulating IPP Document objects;
- 274 5. Extend existing operations to explicitly create IPP Document objects;
- 275 6. Define security requirements necessary to support IPP Document objects; and
- 276 7. Define sections to register all objects, attribute groups, attributes, values, and
- 277 operations with IANA.
- 278

279 4. Model

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

284 4.1 Document Object

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



292

293

Figure 1 - Document Object Life Cycle

294 4.2 Operations

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

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

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

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

307

Table 1 - IPP Operations

Operation	Target	Conformance	Reference
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

308 **4.3 Job and Document Template Attributes**

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

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

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

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

325 **5. New Operations**

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

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

330 **5.1 Document Operations**

331 **5.1.1 Cancel-Document**

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

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

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

346 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
347 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
348 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
349 appropriate.
350

351

Table 2 - Document State Transitions for Cancel-Document

Current "document-state"	New "document-state"	Printer's response status code and action:
'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'

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

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

359 5.1.1.1 Cancel-Document Request

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

361 Group 1: Operation Attributes

362 Natural Language and Character Set:

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

365 Target:

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

372 Requesting User Name:

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

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

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

380 5.1.1.2 Cancel-Document Response

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

382 Group 1: Operation Attributes

383 Status Message:

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

388 Natural Language and Character Set:

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

391 Group 2: Unsupported Attributes

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

393 5.1.2 Get-Document-Attributes

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

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

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

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

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

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

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

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

417 **5.1.2.1 Get-Document-Attributes Request**

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

419 Group 1: Operation Attributes

420 Natural Language and Character Set:

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

423 Target:

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

430 Requesting User Name:

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

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

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

439 5.1.2.2 Get-Document-Attributes Response

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

441 Group 1: Operation Attributes

442 Status Message:

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

447 Natural Language and Character Set:

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

452 Group 2: Unsupported Attributes

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

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

461 Group 3: Document Attributes

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

472 5.1.3 Set-Document-Attributes

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

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

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

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

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

“document-state”	Printer’s response status code and “action”
'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'

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

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

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

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

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

515 **5.1.3.1 Set-Document-Attributes Request**

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

517 Group 1: Operation Attributes

518 Natural Language and Character Set:

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

521 Target:

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

528 Requesting User Name:

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

531 Group 2: Document Attributes

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

537 **5.1.3.2 Set-Document-Attributes Response**

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

540 Group 1: Operation Attributes

541 Status Message:

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

546 Natural Language and Character Set:

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

549 Group 2: Unsupported Attributes

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

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

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

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

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

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

580 **5.2 Job Operations**

581 **5.2.1 Get-Documents**

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

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

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

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

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

600 5.2.1.1 Get-Documents Request

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

602 Group 1: Operation Attributes

603 Natural Language and Character Set:

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

605 Target:

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

609 Requesting User Name:

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

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

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

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

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

629 5.2.1.2 Get-Documents Response

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

631 Group 1: Operation Attributes

632 Status Message:

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

637 Natural Language and Character Set:

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

640 Group 2: Unsupported Attributes

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

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

649 Groups 3 to N: Document Attributes

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

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

662 **6. New Attributes**663 **6.1 Document Description Attributes**664 **6.1.1 document-name (name(MAX))**

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

668 **6.2 Document Status Attributes**

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

672

Table 4 - Document Status Attributes

Document Attribute	Operation/Job Attribute	Reference
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]

673 Note 1: The "document-state" attribute supports all of the "job-state" values *except*
674 '4' (pending-held).

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

678 6.2.1 document-charset (charset)

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

683 6.2.2 document-format-detected (mimeMediaType)

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

686 6.2.3 document-message (text(MAX))

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

693 6.2.4 document-number (integer(1:MAX))

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

697 6.2.5 last-document (boolean)

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

703 6.3 Document Template Attributes

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

706 **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]

707 6.4 Operation Attributes

708 6.4.1 document-charset (charset)

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

711 6.4.2 document-number (integer(1:MAX))

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

714 **6.5 Printer Description Attributes**

715 **6.5.1 document-creation-attributes-supported (1setOf type2 keyword)**

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

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

725 **7. New Attribute Group Tags**

726 **7.1 document-attributes-tag**

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

729

730 **8. Additional Semantics for Existing Operations**

731 **8.1 Cancel-Job: "document-state" and "document-state-reasons"**

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

736 **8.2 Hold-Job and Release-Job: "document-state-reasons"**

737 These OPTIONAL operations affect the state of the target Job. The values of the
738 Documents’ “document-state-reasons” Document Status attributes MUST NOT be affected
739 by these operations.

740 **8.3 Print-Job, Print-URI: Document Object and Attributes**

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

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

747 **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
job-k-octets	k-octets	[STD92], Section 6.2
job-media-sheets	media-sheets	[STD92], Section 6.2

748

749

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 6.2
document-state-message	OPTIONAL	OPTIONAL	Section 6.2
document-state-reasons	OPTIONAL	REQUIRED	Section 6.2

750 **8.3.1 Print-Job/Print-URI Response**

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

752 Group 1: Operation Attributes

753 As specified in [STD92].

754 Group 2: Unsupported Attributes

755 As specified in [STD92].

756 Group 3: Job Object Attributes

757 As specified in [STD92].

758 Group 4: Document Object Attributes (new)

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

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

762 "document-state" (type1 enum):

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

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

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

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

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

769 8.4 Send-Document: Document Object and Attributes

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

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

777 Finally, Printers also return the attributes listed in

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

779 **8.4.1 Send-Document Request**

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

781 Group 1: Operation Attributes

782 As specified in [STD92].

783 Group 2: Document Template Attributes (new)

784 The Client OPTIONALLY supplies and the Printer MUST support a set of
785 Document Template attributes. If the Client is not supplying any Document
786 Template attributes in the request, the Client SHOULD omit Group 2 rather
787 than sending an empty group. However, a Printer MUST be able to accept
788 an empty group.

789 Group 3: Document Data

790 As specified in [STD92].

791 **8.4.2 Send-Document Response**

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

793 Group 1: Operation Attributes

794 As specified in [STD92].

795 Group 2: Unsupported Attributes

796 As specified in [STD92].

797 Group 3: Job Object Attributes

798 As specified in [STD92].

799 Group 4: Document Object Attributes (new)

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

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

803 "document-state" (type1 enum):

- 804 The Printer MUST return the state of this Document object.
- 805 "document-state-reasons" (1setOf type2 keyword):
- 806 The Printer MUST return the associated state reasons for this Document.
- 807 "document-state-message" (text(MAX)):
- 808 The Printer MAY return the localized description of the "document-state" and
809 "document-state-reasons" values for this Document.

810 **8.5 Send-URI: Document Object and Attributes**

- 811 This specification extends the OPTIONAL Send-URI operation [STD92] to explicitly create
812 a Document object and copy the operation attributes listed in Table 6 to the corresponding
813 Document attributes.
- 814 The Send-URI request is also extended to support an additional Document Template
815 attribute group after the operation attribute group. Document Template attributes are copied
816 to the Document object after validation as described in section 4.3. Printers MUST NOT
817 copy Document Template attributes to the Job object.
818 Finally, Printers also return the attributes listed in

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

820 **8.5.1 Send-URI Request**

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

822 Group 1: Operation Attributes

823 As specified in [STD92].

824 Group 2: Document Template Attributes (new)

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

830 **8.5.2 Send-URI Response**

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

832 Group 1: Operation Attributes

833 As specified in [STD92].

834 Group 2: Unsupported Attributes

835 As specified in [STD92].

836 Group 3: Job Object Attributes

837 As specified in [STD92].

838 Group 4: Document Object Attributes (new)

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

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

842 "document-state" (type1 enum):

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

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

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

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

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

849 9. Additional Values for Existing Attributes

850 9.1 operations-supported (1setOf type2 enum)

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

852 **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

853 9.2 requested-attributes (1setOf type2 keyword)

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

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

857 'document-template': All Document Template and Printer "xxx-supported" attributes.
858

859 10. Obsolete Operations and Attributes

860 10.1 Obsolete Delete-Document Operation

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

865 10.2 Obsolete Document Status Attributes

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

868 Note: This specification does not change the status of the original operation or Job Status
869 attributes.

870 **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]

871 11. Conformance Requirements

872 11.1 Printer Conformance Requirements

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

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

- 879 6. The internationalization considerations defined in section 12; and
880 7. The security considerations defined in section 13.

881 **11.2 Client Conformance Requirements**

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

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

889 **12. Internationalization Considerations**

890 For interoperability and basic support for multiple languages, conforming implementations
891 MUST support:

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

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

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

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

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

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

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

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

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

911 Unicode Collation Algorithm [UTS10] – sorting

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

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

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

916 Unicode Character Property Model [UTR23] – character properties

917 Unicode Conformance Model [UTR33] – Unicode conformance basis

918 **13. Security Considerations**

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

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

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

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

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

927 **14. IANA Considerations**

928 **14.1 Attribute Registrations**

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

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

932 The registry entries will contain the following information:

933	Document Description attributes:	Reference
934	-----	-----
935	document-name (name (MAX))	[PWG5100.5]

936		Reference
937	Document Status attributes:	
938	-----	-----
939	attributes-charset (charset)	[PWG5100.5]
940	attributes-natural-language (naturalLanguage)	[PWG5100.5]
941	compression(obsolete) (type2 keyword)	[PWG5100.5]
942	current-page-order (type2 keyword)	[PWG5100.5]
943	date-time-at-completed (dateTime)	[PWG5100.5]
944	date-time-at-created (dateTime)	[PWG5100.5]
945	date-time-at-processing (dateTime)	[PWG5100.5]
946	detailed-status-messages (1setOf text(MAX))	[PWG5100.5]
947	document-access-errors (1setOf text(MAX))	[PWG5100.5]
948	document-charset (charset)	[PWG5100.5]
949	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.5]
950	document-format (mimeMediaType)	[PWG5100.5]
951	document-format-details(obsolete) (1setOf collection)	[PWG5100.5]
952	document-format-details-detected(obsolete) (1setOf collection)	
953		[PWG5100.5]
954	document-format-detected (mimeMediaType)	[PWG5100.5]
955	document-format-version(obsolete) (text(127))	[PWG5100.5]
956	document-format-version-detected(obsolete) (text(127))	[PWG5100.5]
957	document-job-id (integer(1:MAX))	[PWG5100.5]
958	document-job-uri (uri)	[PWG5100.5]
959	document-message (text(MAX))	[PWG5100.5]
960	document-natural-language (naturalLanguage)	[PWG5100.5]
961	document-number (integer(1:MAX))	[PWG5100.5]
962	document-printer-uri (uri)	[PWG5100.5]
963	document-state (type1 enum)	[PWG5100.5]
964	document-state-message (text(MAX))	[PWG5100.5]
965	document-state-reasons (1setOf type2 keyword)	[PWG5100.5]
966	document-uri (uri)	[PWG5100.5]
967	impressions (integer(0:MAX))	[PWG5100.5]
968	impressions-completed (integer(0:MAX))	[PWG5100.5]
969	impressions-completed-current-copy(obsolete) (integer(0:MAX))	
970		[PWG5100.5]
971	k-octets (integer(0:MAX))	[PWG5100.5]
972	k-octets-processed (integer(0:MAX))	[PWG5100.5]
973	last-document (boolean)	[PWG5100.5]
974	media-sheets (integer(0:MAX))	[PWG5100.5]
975	media-sheets-completed (integer(0:MAX))	[PWG5100.5]
976	more-info (uri)	[PWG5100.5]
977	output-device-assigned (name(MAX))	[PWG5100.5]
978	printer-up-time (integer(1:MAX))	[PWG5100.5]
979	sheet-completed-copy-number(obsolete) (integer(0:MAX))	[PWG5100.5]
980	time-at-completed (integer(MIN:MAX))	[PWG5100.5]
981	time-at-creation (integer(MIN:MAX))	[PWG5100.5]
982	time-at-processing (integer(MIN:MAX))	[PWG5100.5]
983		
984	Document Template attributes:	Reference
985	-----	-----
986	copies (integer(1:MAX))	[PWG5100.5]
987	cover-back (collection)	[PWG5100.5]
988	<Member attributes are the same as the "cover-back" Job Template	
989	attribute>	[PWG5100.5]
990	cover-front (collection)	[PWG5100.5]

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

1032 14.2 Attribute Value Registrations

1033 The attribute values defined in this specification will be published by IANA according to the
 1034 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1035 <http://www.iana.org/assignments/ipp-registrations>

1036 The registry entries will contain the following information:

1037	Attributes (attribute syntax)	
1038	Keyword Attribute Value	Reference

1039	-----	-----
1040	requested-attributes (1setOf type2 keyword)	[STD92]
1041	document-description	[PWG5100.5]
1042	document-template	[PWG5100.5]

1043 14.3 Type2 enum Registrations

1044 The enum values defined in this specification will be published by IANA according to the
1045 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1046 <http://www.iana.org/assignments/ipp-registrations>

1047 The registry entries will contain the following information:

1048	Attributes (attribute syntax)		
1049	Enum Value	Enum Symbolic Name	Reference
1050	-----	-----	-----
1051	operations-supported (1setOf type2 enum)		[STD92]
1052	0x0033	Cancel-Document	[PWG5100.5]
1053	0x0034	Get-Document-Attributes	{PWG5100.5}
1054	0x0035	Get-Documents	[PWG5100.5]
1055	0x0036	Delete-Document (obsolete)	[PWG5100.5]
1056	0x0037	Set-Document-Attributes	[PWG5100.5]
1057			

1058 14.4 Operation Registrations

1059 The operations defined in this specification will be published by IANA according to the
1060 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1061 <http://www.iana.org/assignments/ipp-registrations>

1062 The registry entries will contain the following information:

1063	Operation Name	Reference
1064	-----	-----
1065	Cancel-Document	[PWG5100.5]
1066	Cancel-Job (extension)	[PWG5100.5]
1067	Delete-Document (obsolete)	[PWG5100.5]
1068	Get-Document-Attributes	[PWG5100.5]
1069	Get-Documents	[PWG5100.5]
1070	Hold-Job (extension)	[PWG5100.5]
1071	Print-Job (extension)	[PWG5100.5]
1072	Print-URI (extension)	[PWG5100.5]
1073	Release-Job (extension)	[PWG5100.5]
1074	Send-Document (extension)	[PWG5100.5]
1075	Send-URI (extension)	[PWG5100.5]
1076	Set-Document-Attributes	[PWG5100.5]

1077 14.5 Attribute Group Registrations

1078 The attribute groups defined in this specification will be published by IANA according to the
1079 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1080 <http://www.iana.org/assignments/ipp-registrations>

1081 The registry entries will contain the following information:

1082	Value	Attribute Group Name	Reference
1083	-----	-----	-----
1084	0x09	document-attributes-tag	[PWG5100.5]

1085 15. Overview of Changes

1086 15.1 IPP Document Object v1.1

1087 The following changes were made to the previous version of this specification [PWG5100.5-
1088 2003]:

- 1089 • Printers no longer need to support multiple Document Jobs;
- 1090 • Rationale and model sections have been added;
- 1091 • References now point to the current versions of dependent documents and
1092 specifications at the time of publication;
- 1093 • The "document-charset" operation attribute has been added to this specification;
- 1094 • The Delete-Document operation has been made obsolete;
- 1095 • Additional semantics for the deprecated Reprocess-Job and Restart-Job operations
1096 have been removed;
- 1097 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no
1098 longer (incorrectly) promoted to persistent Job and Document attributes;
- 1099 • The "compression" Document Status attribute has been made obsolete because it
1100 serves no purpose;
- 1101 • Several "document-format-xxx" Document Status attributes have been made
1102 obsolete because they have serious interoperability issues; and

- 1103 • The "impressions-completed-current-copy" and "sheet-completed-copy-number"
1104 Document Status attributes have been made obsolete because the parent
1105 specification (RFC 3381) is obsolete.

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1107 **16.1 Normative References**

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1192 ipp@pwg.org (subscribers only)

1193 To subscribe, see the PWG web page:

1194 <http://www.pwg.org/>

1195 Implementers of this specification are encouraged to join the IPP Mailing List in order to
1196 participate in any discussions of clarification issues and review of registration proposals for
1197 additional attributes and values.

1198 The editors would like to especially thank the following individuals who also contributed
1199 significantly to the development of this specification:

1200 Dennis Carney (author of v1.0)
1201 Tom Hastings (author of v1.0)
1202 Ira McDonald (High North, Inc.)
1203 Peter Zehler (author of v1.0)

1204 **18. Change History**

1205 **18.1 January 29, 2019**

- 1206 • Status: Prototype
- 1207 • Fixed broken references throughout
- 1208 • Section 10.2: Say "operation and Job Status" instead of "non-document"

1209 **18.2 October 22, 2018**

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

1221 18.3 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.